CONTRACT NO. DAAA15-94-D-0012
Task Order 2

FINAL RECORD OF DECISION FOR THE DEFENSE REUTILIZATION AND MARKETING OFFICE YARD (AOC 32) AND PETROLEUM, OIL, AND LUBRICANTS STORAGE AREA (AOC 43A) DEVENS, MASSACHUSETTS

February 1998

Prepared for:

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DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Area of Contamination (AOCs) 32, the Defense Reutilization and Marketing Office (DRMO) Yard and AOC 43A, the Petroleum, Oil, and Lubricants (POL) Storage Area Devens, Massachusetts

STATEMENT OF PURPOSE AND BASIS

This decision document presents the U.S. Army's (Army's) selected remedial actions for AOCs 32 DRMO Yard, including Underground Storage Tank (UST) #13), and 43A (the POL Storage Area) at Devens, MA. It was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended, 42 United States Code (U.S.C.) §9601 *et seq.*, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as amended, 40 Code of Federal Regulations (CFR) Part 300, to the extent practicable. The Devens Base Realignment and Closure (BRAC) Environmental Coordinator; the Installation Commander; and the Director of the Waste Management Division, U.S. Environmental Protection Agency (USEPA) New England have been delegated the authority to approve this Record of Decision (ROD).

This ROD is based on the Administrative Record that has been developed in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the Devens BRAC Environmental Office, Building P-12, Devens, MA, and the Ayer Town Hall, Main Street, Ayer, MA. The Administrative Record Index (appendix A of this ROD) identifies each of the items considered during the selection of the remedial actions.

ASSESSMENT OF THE SITE

Actual or potential releases of hazardous substances from AOCs 32 and 43A, if not addressed by implementing the response actions selected in this ROD, may present an imminent and substantial endangerment to public health and welfare or to the environment.

DESCRIPTION OF THE SELECTED REMEDIES

These remedial actions address long-term site worker exposure to contaminated soil at AOC 32 and potential consumption of groundwater at AOCs 32 (including UST #13) and 43A.

The selected soil remedial alternative for AOC 32 is excavation and off-site disposal. This alternative will remove soils identified as contaminated and reduce the potential risk of future site worker exposure to contaminated soils. The major components of the selected remedy include the following:

- Excavating contaminated soil (1,300 cubic yards) (confirmatory sampling will be conducted prior to backfilling)

- Immediately transporting soils to an off-site, nonhazardous landfill for disposal
- Backfilling the excavated area with clean material and revegetating the area
- Monitoring groundwater on an annual basis and reviewing the site every 5 years for 30 years or until contamination is reduced to acceptable concentrations

The selected groundwater remedial alternative for AOCs 32 and 43A includes institutional controls, intrinsic remediation, groundwater flow and contaminant transport modeling, and long-term groundwater monitoring to evaluate the effectiveness of the alternative at mitigating groundwater contamination and site risk. This ROD will use the more descriptive name "monitored natural attenuation" in place of "intrinsic remediation." This usage is consistent with current USEPA guidance. The remedy will mitigate existing groundwater contamination through use of restrictions, natural attenuation, and bioremediation, thereby reducing the potential risk that future site workers will be exposed to contaminated groundwater. Monitored natural attenuation is the combination of physical, chemical, and biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater in a reasonable time frame. These insitu processes include biodegradation, dispersion, dilution, adsorption, volatilization, and biological and chemical stabilization or destruction of contaminants. The major components of the selected remedy include the following:

- Establishing institutional controls
- Installing additional groundwater monitoring wells
- Providing for monitored natural attenuation
- Collecting data on monitored natural attenuation, assessing the data, and performing groundwater modeling
- Performing long-term groundwater monitoring on an annual basis
- Reviewing the site every 5 years for 30 years or until contamination is reduced to acceptable concentrations
- Providing annual data reports to USEPA and the Massachusetts Department of Environmental Protection (MADEP)

If the monitored natural attenuation assessment results at AOC 32 and 43A indicate that the groundwater contaminant plume can not be remediated within 30 years, an additional clean-up action will be evaluated and implemented as appropriate for each AOC. If at any time during the monitored natural attenuation there is an indication that the contaminants are migrating into the currently established Zone II boundary or an area located sufficiently inside the boundary in which compliance will be determined, according to clean-up criteria stated in the Record of Decision, that a minimum will meet drinking water standards; then the Army will implement an additional remedial action which will be protective of human health and the environment.

STATE CONCURRENCE

The Commonwealth of Massachusetts has concurred with the selected remedy. Appendix B of this ROD contains a copy of the declaration of concurrence.

DECLARATION

The selected remedies are consistent with CERCLA, and to the extent practicable, the NCP; protective of human health and of the environment; in compliance with Federal and Commonwealth requirements that are legally applicable or relevant and appropriate to the remedial action; and cost-effective. The remedies use permanent solutions and alternative treatment technologies to the maximum extent practicable for both AOCs 32 and 43A.

Because the selected remedies for both AOCs 32 and 43A may result in hazardous substances remaining on-site in soil and groundwater above certain health-based exposure levels, a review will be conducted within 5 years of commencing the remedial action to ensure that the remedy at each AOC continues to provide adequate protection of human health and the environment.

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. DEPARTMENT OF THE ARMY

James C Chambers

JAMES C. CHAMBERS
Environmental Coordinator
Devens Reserve Forces Training Area

28 JAN 98

Date

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. DEPARTMENT OF THE ARMY

Edward R. Murdough
Lieutenant Colonel, U.S. Army
Installation Commander

28 Jan 98
Date

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. ENVIRONMENTAL PROTECTION AGENCY

Frank Cianfrani — 2-18-98

Harley F. Laing — Date
Director, Office of Site Remediation and restoration
U.S. Environmental Protection Agency, New England

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LIST OF ACRONYMS AND ABBREVIATIONS

α-BHC	alpha-Benzene hexachloride (alpha-lindane)
AOC	Area of Contamination
ARAR	applicable or relevant and appropriate requirement
AST	aboveground storage tank
BGS	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	chemical of potential concern
DCE	dichloroethene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DNB	dinitrobenzene
DRMO	Defense Reutilization and Marketing Office
EBS	Environmental Baseline Survey
E&E	Ecology and Environment, Inc.
EPH	extractable petroleum hydrocarbons
FS	feasibility study
HA	health advisory
HI	hazard index
IAG	Interagency Agreement
IRP	Installation Restoration Program
MADEP	Massachusetts Department of Environmental Protection
MCL	maximum contaminant level
MMCL	Massachusetts maximum contaminant level
MEP	Master Environmental Plan
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	no further action
NPL	National Priorities List
O&M	operation and maintenance
ORSG	Office of Research and Standards Guidance
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PM_{10}	particulate matter less than 10 microns (μ) in size
POL	petroleum, oil, and lubricants
PPE	personal protection equipment
PRE	preliminary risk evaluation
QA/QC	quality assurance/quality control
RAB	Restoration Advisory Board

RAO	remedial action objective
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RME	reasonable maximum exposure
ROD	Record of Decision
SA	study area
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
SF	slope factor
SI	site investigation
TAL	target analyte list
TBC	to be considered
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TOC	total organic carbon
TNB	trinitrobenzene
TPHC	total petroleum hydrocarbons
TRC	Technical Review Committee
TSCA	Toxic Substances Control Act
USAEC	United States Army Environmental Center
U.S.C.	U.S. Code
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
VPH	volatile petroleum hydrocarbons

UNITS OF MEASURE

μ	microns
μg/g	microgram(s)/gram
μg/L	microgram(s)/liter
mg/kg	milligram(s)/kilogram
ppm	part(s) per million

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

Devens is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, National Priorities List (NPL) site located in the towns of Ayer and Shirley (Middlesex County) and Harvard and Lancaster (Worcester County), approximately 35 miles northwest of Boston, MA (figure 1, appendix C). Prior to closure, the Fort Devens installation occupied approximately 9,600 acres and was divided into the North Post, Main Post, and South Post.

This Record of Decision (ROD) addresses soil contamination in Area of Contamination (AOC) 32 (the Defense Reutilization and Marketing Office (DRMO) Yard) and groundwater contamination in AOC 32 and 43A (the Petroleum, Oil, and Lubricants (POL) Storage Area). AOC 32 is located in Functional Area II, which is in the northeast corner of the Main Post at Fort Devens. AOC 43A is located just to the south of AOC 32, across Market Street (figure 2, appendix C).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Response History

Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931 the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, Fort Devens served as a training and induction center for military personnel and as a unit mobilization and demobilization site. Some or all of these functions were conducted during World Wars I and II, the Korean and Vietnam conflicts, and Operations Desert Shield and Desert Storm. During World War II, more than 614,000 inductees were processed, and Fort Devens reached a peak population of 65,000.

The primary mission of Fort Devens was to command, train, and provide logistical support for nondivisional troop units. Fort Devens was selected for cessation of operations and closure under the Defense Base Realignment and Closure (BRAC) Act of 1990 (Public Law 101-510). The installation was officially closed in 1996, and the site was renamed Devens, MA. Devens presently supports the Army Readiness Region and National Guard units in the New England area.

1. Defense Reutilization and Marketing Office Yard (Area of Contamination 32)

AOC 32, the DRMO Yard, consists of three fenced areas (figure 3, appendix C). The DRMO Yard on the west side of Cook Street (West Yard) contained used equipment, including lead-acid batteries, telecommunications equipment, and administrative equipment. The yard on the east side of Cook Street (East Yard) was used for disassembling vehicles for reusable parts and previously contained scrap metal, tires, stored items ready for sale, and used photographic

solutions. The only unpaved, fenced area is located just north of the East Yard and was used to store and recycle tires.

A former underground storage tank (UST) site (UST #13) has been incorporated into AOC 32. This UST was used to store waste oil and was located just northeast of Building T-204. UST #13 and the remainder of AOC 32 are in separate groundwater regimes.

2. Petroleum, Oils, and Lubricants Storage Area (Area of Contamination 43A)

The POL Storage Area is located across Market Street from AOC 32 and served as the central distribution point for all gasoline and other fuels at Fort Devens from the 1940s to the present. AOC 43A consists of a fenced lot located within a developed industrial area (figure 3, appendix C).

A more complete description of AOCs 32 and 43A can be found in the *Remedial Investigation (RI) Reports for Functional Area II,* prepared by Ecology and Environment, Inc. (E&E) (August 1994), section 1.2, and the feasibility study (FS) report (January 1997), subsection 1.2.

B. Enforcement History

In conjunction with the Army's Installation Restoration Program (IRP), Fort Devens and the U.S. Army Environmental Center (USAEC) initiated a Master Environmental Plan (MEP) in 1988. The MEP assessed the environmental status of study areas (SAs), discussed necessary investigations, and recommended potential responses to environmental contamination. Priorities for environmental restoration at Fort Devens were also assigned. The MEP identified 18 historic gas station sites (SA 43B through 43S) and the then-active POL storage area (SA 43A) as some of the potential sources of groundwater contamination and recommended that each SA be investigated to determine the distribution of contamination.

On December 21, 1989, Fort Devens was placed on the NPL under CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA). The Army and U.S. Environmental Protection Agency (USEPA) New England developed and signed a Federal Facilities Agreement (Interagency Agreement (IAG)) on May 13, 1991. It was finalized on November 15, 1991. The IAG provides the framework for implementing the CERCLA/SARA process at Devens.

In 1991, the Army, through the USAEC, initiated site investigations (SIs) at AOC 32. The final SI report was issued in December 1992. The SI reported contamination exceeding screening levels for soil, water, and sediment in the storm drains and in the groundwater at AOC 32.

An SI was conducted in 1992 on the POL and the historic gas station SAs at Fort Devens. The results are presented in the 1993 SI report. Field screening followed by confirmation sampling

showed a low level of xylene and elevated petroleum hydrocarbons in subsurface soils at AOC 43A.

The objectives of the RI were to determine the nature and distribution of contamination at the AOCs, assess the risk to human health, and provide a basis for conducting feasibility studies. The final RI report was issued in 1994.

The FS report that evaluated remedial action alternatives for cleanup at AOCs 32 and 43A was issued in January 1997. The FS report identified and screened seven remedial alternatives at AOC 32 Soils Operable Unit, six remedial alternatives for AOC 32 (UST #13) Groundwater Operable Unit, and three remedial alternatives at POL Storage Area/DRMO Yard Groundwater Operable Unit (AOC 43A and 32). The FS also provided a detailed analysis of each of these remedial alternatives to allow decision makers to select a remedy for soil cleanup at AOC 32 and groundwater cleanup at POL Storage Area/DRMO Yard and UST #13.

The proposed plan detailing the Army's preferred remedial alternative was issued on July 18, 1997, for public comment. Technical comments presented during the public comment period are included in the Administrative Record. Appendix D, the Responsiveness Summary, contains a summary of these comments and the Army's responses and describes how these comments affected the remedy selection.

III. COMMUNITY PARTICIPATION

The Army has held regular and frequent informational meetings, issued a proposed plan and press releases, and held public meetings to keep the community and other interested parties informed of activities at AOCs 32 and 43A.

In February 1992, following public review, the Army released a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in remedial activities at Devens. As part of this plan, the Army established a Technical Review Committee (TRC) in early 1992. The TRC, as required by SARA section 211 and Army Regulation 200-1, included representatives from USEPA, USAEC, Devens, Massachusetts Department of Environmental Protection (MADEP), local officials, and the community. Until January 1994, when it was replaced by the Restoration Advisory Board (RAB), the TRC generally met quarterly to review and provide technical comment on schedules, work plans, work products, and proposed activities for the SAs/AOCs at Devens. The SI, RI, and FS reports; proposed plan; and other related support documents were all submitted to the TRC or RAB for their review and comment.

When an installation closure involves transfering property to the community, the Army, as part of its commitment to involve the affected communities, forms a RAB. The Devens RAB was formed in February 1994. The RAB consists of 28 members (15 original TRC members plus 13

new members) who are representatives from the Army, USEPA New England, MADEP, local governments, and citizens of the local communities. The RAB meets monthly and provides advice to the installation and regulatory agencies on Devens cleanup programs. Specific responsibilities include addressing cleanup issues such as land use and cleanup goals, reviewing plans and documents, identifying proposed requirements and priorities, and conducting regular meetings that are open to the public.

On June 18, 1997, the Army issued the proposed plan to citizens and organizations to provide the public with a brief explanation of the Army's preferred remedy for cleanup at both AOC 32 and 43A. The proposed plan also described the opportunities for public participation and provided details on the upcoming public comment period and public meetings.

A public notice announcing the public meeting was published the week of June 18, 1997, in the *Times Free Press/Public Spirit*, the *Lowell Sun, Fitchburg-Leominster Centennial and Enterprise*, and the *Worcester Telegram*. The Army also made the proposed plan available to the public at the information repositories at the town libraries in Ayer, Shirley, Lancaster, and Harvard and in the Devens BRAC Environmental Office.

From June 18, 1997, to July 18, 1997, the Army held a 30-day public comment period to accept public comments on the alternatives presented in the FS and the proposed plan, as well as other documents released to the public. On July 17, 1997, the Army held a public meeting at Devens to present the Army's proposed plan to the public, accept verbal or written comments from the public, and discuss the cleanup alternatives evaluated in the FS. This meeting also provided the opportunity for open discussion concerning the proposed cleanup. A transcript of this meeting, public comments, and the Army's response to comments are included in the attached Responsiveness Summary (appendix D).

All supporting documentation for the decision regarding AOCs 32 and 43A is contained in the Administrative Record. The Administrative Record is a collection of all the documents the Army considered in choosing the remedy for both AOCs 32 and 43A. The Army has made the Administrative Record available for public review at the Devens BRAC Environmental Office and at the Ayer Town Hall, Ayer, MA. An index to the Administrative Record is available at the USEPA Records Center, 90 Canal Street, Boston, MA and is provided as appendix A.

IV. SCOPE AND ROLE OF THE RESPONSE ACTION

The Army developed the selected remedies by combining components of different source control and migration management alternatives. The selected remedies for AOCs 32 and 43A will remove contaminated soil and control the migration of contaminants in groundwater, reduce contaminant concentrations, and control potential groundwater use. The selected remedies will also provide environmental monitoring of groundwater for a period of up to 30 years.

Implementing the selected alternatives will not adversely affect any future response actions at AOCs 32 and 43A, should they be required.

These remedial actions will address the principal threats to human health at AOCs 32 and 43A posed by long-term site worker exposure to contaminated soils and groundwater.

V. SUMMARY OF SITE CHARACTERISTICS

A. Area of Contamination 32 — The Defense Reutilization and Marketing Office Yard and Underground Storage Tank #13

AOC 32, the DRMO Yard, is located in the northeast corner of the Main Post at Devens (figure 2, appendix C). This site is bordered on the north by the recently capped Shepley's Hill Landfill. To the south across Market Street is the POL Storage Area (AOC 43A) and the remainder of the Main Post, which consists of buildings, roads, and mowed grass lots. The DRMO was used as a materials storage facility. Operational records indicate that the facility was active from at least 1964 to 1995. The nature of materials that were processed and the activities conducted in this yard varied significantly.

AOC 32 consists of three fenced areas incorporating approximately 280,000 square feet (figure 3, appendix C). The DRMO yard on the west side of Cook Street (West Yard) contained used equipment, including lead-acid batteries, telecommunications equipment, and administrative equipment. The yard on the east side of Cook Street (East Yard) was used for disassembling vehicles for reusable parts and previously contained scrap metal, tires, stored items ready for sale, and used photographic solutions. The only unpaved fenced area is located just north of the East Yard and was used to store and recycle tires. The enclosure for the two paved sections of the DRMO Yard and the tire storage area consists of a 6-foot tall chain-link fence, topped with barbed wire.

Because vehicle scrap was found in the East Yard, a radiation survey was performed. Twelve "hot spots" were found. All were located in the north end of the East Yard and all were remediated in 1996 by removing radium-contaminated soil or radium dials.

A pit is located in the East Yard that was reported to be part of the remediation of a polychlorinated biphenyl (PCB)-contaminated rectifier oil spill in 1990. Approximately 600 gallons of liquid from the remaining electrical units and 40 cubic yards of potentially contaminated asphalt and soil were removed from the site. The oil was analyzed and found to not contain PCBs (minimum detection level of 21 parts per million (ppm)). The removed material was, therefore, handled as oil-contaminated waste.

A former UST site (UST #13) was incorporated into AOC 32. This UST, which was removed in 1992, was used to store waste oil and was located just northeast of Building T-204. Three

trenches were excavated around the former UST site during the RI in an attempt to characterize any hydrocarbon plume that may have migrated from the former tank. Two of the three trenches were found to be clean based on field screening for organic vapors. The third trench was extended to a drainfield, where approximately 2 cubic yards of petroleum-contaminated soil were encountered. The source of the contamination was found to be waste debris that included oil filters. UST #13 is located in a separate groundwater regime from the DRMO Yard.

B. Area of Contamination 43A — The Petroleum, Oils, and Lubricants Storage Area

AOC 43A, the POL Storage Area, is located across Market Street from AOC 32 and is bounded on the south, west, and north by Antietam Street, Cook Street, and Market Street. It is located in the northeast corner of the Main Post, adjacent to Shepley's Hill Landfill.

The POL Storage Area served as the central distribution point for all gasoline stations at Fort Devens during the 1940s and 1950s. It was subsequently used to store fuels for various purposes. The distribution facility formerly consisted of a main gasoline station building (T-401) (figure 3, appendix C), a pump house, four 12,000-gallon USTs, one 10,000-gallon UST, two 12,000-gallon aboveground storage tanks (ASTs), and two 8,000-gallon ASTs. Gasoline was delivered to the facility by rail car and transferred to the tanks.

Between 1965 and 1972, four ASTs located in a pit behind T-401 were removed. In 1989 and 1990, five USTs located near the pump house were excavated at the site. All five tanks were listed as storage tanks for fuel oil. In 1989 and 1990, three USTs and 800 cubic yards of soil beneath the pump house were excavated. The excavated soil was analyzed for total petroleum hydrocarbons (TPHCs). The highest TPHC concentration was 237 milligrams per kilogram (mg/Kg). In 1991, five new USTs were installed in the POL Storage Area and were used to store fuel for military vehicles.

The POL Storage Area consists of a fenced lot located within a developed industrial area of buildings, roads, and grass lots, with the exception of the east side of the site, which is bounded by a wooded area on a rock outcrop. A set of railroad tracks, formerly used to transport fuels to the site, forms the site's northern boundary. The UST area is fenced. An asphalt driveway leads into the POL Storage Area from Antietam Street. The driveway is bermed to contain any spills. A pump station is located in the center of the fenced area and the new USTs are located on the eastern side.

Section 1 of the AOCs 32 and 43A FS report contains an overview of the RI completed for each AOC. A complete discussion of site characteristics can be found in sections 5, 6, and 7 of the RI report (E&E 1994). Significant findings of the RI are summarized in the following subsections of this ROD.

1. Soils

a. Area of Contamination 32 — The Defense Reutilization and Marketing Office Yard and Underground Storage Tank #13

Twenty surface soil samples were collected from AOC 32 and the surrounding area. Surface soil sampling locations are shown in figure 4, appendix C. The samples were analyzed for target analyte list (TAL) metals, target compound list (TCL) pesticides/PCBs, and TPHC. Petroleum hydrocarbons, heavy metals, PCBs, and pesticides were detected in soils surrounding AOC 32. The RI report identified cadmium, lead, and beryllium as exceeding various standards. Except for two samples showing dichlorodiphenyltrichloroethane (DDT), the pesticide levels were below screening values. Since DDT was detected mainly in areas near roads and buildings, its presence may or may not be site related. The elevated TPHC, metals, and PCBs were primarily located around the East Yard and the Tire Recycling Yard. PCBs were detected in site soils at concentrations in excess of State standards. These locations were all possible drainage points for the asphalt-covered East Yard. Results of the chemical analysis are summarized in table 1, appendix E. It appears that the contaminated soil is caused by site drainage, perhaps from oil laden with heavy metals and PCBs. The northeast portion of the East Yard is also the area where suspected PCB oils were spilled from stored rectifiers.

Fifteen boreholes were advanced in October 1992. The boreholes were located in the West Yard, Tire Storage Area, and East Yard (figure 4, appendix C). The boreholes were generally sampled at depths of 1, 5, and 10 feet, except for one sample that was collected at the surface because the location was unpaved. The subsoil samples were analyzed for TAL metals, TCL pesticides/PCBs, and TPHC. The analytical results are summarized in table 2, appendix E. Lead concentrations exceeded the screening value for subsurface soil at the 1-foot depth in two boreholes. Arsenic exceeded the screening value at the 5-foot depth in one borehole and at the 10-foot depth in another borehole. No organic compounds exceeded screening values for subsurface soils in the DRMO Yard.

In general, no significant contamination appeared in the subsurface soils at the DRMO Yard, with the exception of one borehole. That borehole had elevated metals, pesticides, and TPHC concentrations at the 1-foot depth. Elevated levels of PCBs could be due to the boring's location, adjacent to the area where it is suspected that PCB-laden oil was spilled onto the soil. The TPHC and metals concentrations are probably the cumulative result of very localized incidents at the DRMO Yard.

On October 29, 1992, three test trenches were excavated around the former UST #13 excavation. The trenches were located on the east (T-shaped), north, and south sides (T-shaped) of the former UST location. The samples were analyzed for TAL metals, TCL pesticides/PCBs, TCL volatile organic compounds (VOCs), and TPHC. The analytical results are summarized in table 3, appendix E. The east trench showed elevated TPHC and lead concentrations that could be associated with debris (e.g., oil filters, cans, glass bottles) and a former leachfield encountered

during the excavation and was not apparently associated with the former UST. During the RI, three test pits were sampled around the former UST site. Arsenic exceeded its screening value in one pit. Lead exceeded its screening value in a second pit, which also exhibited TPHC.

b. Area of Contamination 43A — The Petroleum, Oil, and Lubricants Storage Area

Ten surface soil samples were collected from the POL storage area and analyzed for TAL metals, polynuclear aromatic hydrocarbons (PAHs), pesticides/PCBs, and TPHC. Sampling locations are shown in figure 5, appendix C. Several metals concentrations in surface soils exceeded background: arsenic, calcium, cobalt, copper, lead, nickel, sodium, and zinc. Arsenic exceeded the screening level in one sample. Organic compounds detected in surface soils included DDT, dichlorodiphenyldichloroethylene (DDE), dichlorodiphenyldichloroethane (DDD), alpha-benzene hexachloride (α-BHC), nine PAH compounds, and heptadecane. Five PAH compounds exceeded screening values in one sample. The levels of TPHC are very low considering their location within a POL storage area. Results of the chemical analysis are summarized in table 4, appendix E.

One hundred eighty-three subsurface soil samples were collected from boreholes during field activities at the POL Storage Area. The samples were collected at intervals of 5 feet above the water table, at the water table, and 5 feet below the water table. Fifteen of the subsurface samples were collected and analyzed for TCL VOCs, TCL PAHs, TCL pesticide/PCBs, TAL metals, and TPHC. Most of the samples underwent field screening analysis for benzene, toluene, ethylbenzene, and xylene (BTEX) and TPHC.

None of the 18 samples collected from six additional confirmation boreholes had metal concentrations above screening values. Three of the 18 samples contained arsenic concentrations slightly above the screening value for soils. Subsurface soils showed relatively high TPHC concentrations in two boreholes. One sample (21,000 micrograms per gram (μg/g)) exceeded the screening value. No organics or pesticides exceeded screening values for subsurface soil. The results of the chemical analysis are summarized in table 5, appendix E.

Two onsite hydrocarbon plumes and one small offsite plume were detected in the subsurface soils by field screening. The easternmost plume, which is approximately 120 feet long and 100 feet wide, originates close to the site of the removed USTs, inside the fenced area. A second plume (120 feet long by 90 feet wide), defined from field screening, originates on the western side of the POL Storage Area, close to the former ASTs site . The third plume originates north of Building T-247, which is across Antietam Street from AOC 43A. All three plumes are presented in figure 6, appendix C.

The highest TPHC concentrations (30,000 mg/kg at 25 to 27 feet below ground surface (BGS)) in subsurface soils were measured in the easternmost plume. No BTEX compounds were detected during the soil screening within the boundaries of the easternmost plume. The elevated

TPHC concentrations were verified by two confirmation borehole samples. Apparently the contaminants migrated vertically through the vadose zone before reaching the top of bedrock or the silty material just above the bedrock, then spread laterally to the southeast and northwest. The source of the plume appears to be subsurface related.

Concentrations of TPHC were much lower in the westernmost plume. BTEX compounds were detected in three boreholes. Apparently the product migrated vertically through the vadose zone before dissolving in groundwater and spreading laterally to the southwest without leaving any residual contamination in the soil, suggesting that the material forming the plume was more mobile, volatile, and biodegradable. The source of the plume appears to be surface related.

The third plume is north of the lawnmower maintenance building across Antietam Street from AOC 43A. Screening concentrations of TPHC were very low in the third plume, but BTEX compounds were detected as high as 4,700 mg/kg. This plume may have been identified due to a high "background." Since the occurrence of high background levels cannot be definitely asserted, the data were reported. Confirmation samples from two additional soil borings had relatively low TPHC concentrations and did not contain detectable BTEX compounds.

TPHC were also detected in several boreholes unrelated to the aforementioned plumes. A TPHC concentration of 100 μg/g was found in 43SA93-44S, which was located in front of Building 213. Three soil borings in the parking lot across Antietam Street from AOC 43A had TPHC levels ranging from 56 μg/g to 180 μg/g. Since TPHC levels were not detected in the two confirmation boreholes between these borings, the results suggest variability in the screening analysis or in the distribution of the contaminant.

2. Groundwater

a. Area of Contamination 32 — The Defense Reutilization and Marketing Office Yard and Underground Storage Tank #13

Groundwater samples were collected in November 1992 and March and June 1993. The first two rounds of samples were analyzed for TCL organics, TAL metals, TPHC, and hardness. A few samples were also analyzed for dissolved TAL metals. The results of the chemical analysis are summarized in tables 6 and 7, appendix E. The third round of samples was analyzed for total and dissolved TAL metals, explosives, and hardness. Due to the silt and clay content of the groundwater from all wells, the metals concentrations in the unfiltered samples exceeded screening values. To distinguish between total and dissolved metals in the groundwater, additional samples were collected and filtered through 0.45-micron (μ) glass filters. Toxic heavy metals concentrations of arsenic, cadmium, chromium, and copper often correlated with aluminum and iron concentrations, suggesting that the heavy metals could be present in suspended material or could be sorbed onto aluminum or iron oxides.

The unfiltered metals results exceeded screening values for aluminum, iron, and manganese, indicating that concentrations of other metals associated with particulates would also be elevated. Other unfiltered metals that exceeded USEPA maximum contaminant levels (MCLs) were arsenic, beryllium, chromium, lead, sodium, and nickel. Filtered samples exceeded the MCLs for aluminum, manganese, sodium, and iron. Elevated sodium is attributed to the proximity of the well to an area that carries runoff containing road salt. Manganese concentrations were as high or higher in filtered samples as they were in unfiltered samples from the same well. High levels of soluble manganese appear to occur naturally in the groundwater at this site. Apart from an elevated dissolved manganese concentration, which appears to be a natural condition, there is no convincing evidence that AOC 32 has any dissolved metals concentrations above screening values attributable to DRMO activities.

The upgradient well contained several organic compounds. Bis(2-ethlhexyl)phthalate exceeded the screening value in only one round of analysis. The other down-gradient wells contained one or more of eight detected organic compounds, including 6-aminohexanoic acid lactum, dodecanoic acid, di-n-butylphthalate, 1,2-dichloroethane, acetone, toluene, chloroform, and trichloroethene (TCE). TCE was the only chemical that exceeded its screening value. It exceeded its screening value in only one well, POL-3, which is immediately downgradient of the DRMO Yard. Wells further downgradient of the site in the POL Storage Area do not have detectable levels of TCE.

The groundwater quality and flow in the area of the former UST (UST #13) were defined by three wells adjacent to the excavation area and two additional wells. These five wells are located east of the groundwater divide in a separate groundwater flow system from the other DRMO Yard wells. Inorganics in the groundwater showed the same characteristics as those in the DRMO Yard wells. Unfiltered samples were typically high in aluminum, iron, and manganese and exceeded MCL values for lead and arsenic. Only one well exceeded screening values (arsenic and manganese) in filtered samples. It appears that both arsenic and manganese could reflect residual impacts from the former UST, but these impacts do not appear to extend off-site.

The two wells closest to the UST excavation greatly exceeded screening values for TPHC. They also showed a wide range of organics (13 in one well and 10 in the second well), dominated by dichlorobenzenes, that exceeded screening values. TCE exceeded screening values in 32M-92-06X. A significant decline in organic concentrations was noted during subsequent groundwater analyses, except for TPHC concentrations, which were consistent. Based on existing data, only the two wells closest to the excavation exceeded MCLs. Both wells have multiple exceedences. The groundwater regime in the area is complex and difficult to predict. The detailed directions of groundwater flow and the possible contamination migration routes cannot be identified with any certainty. Oil that contained chlorinated aromatics was apparently spilled on the surface. Analytical results from the UST and oil-soaked overburden removals and excavation trench confirm that no contaminant source associated with the UST activity remains at the former UST site except within fractures in the bedrock. The existing information strongly implies that groundwater contamination is not migrating from the spill location.

b. Area of Contamination 43A — The Petroleum, Oils, and Lubricants Storage Area

Five rounds of groundwater samples were collected and analyzed for both total and dissolved TAL metals, TCL VOCs, pesticides/PCBs, PAHs, explosives, and TPHC. The results of the chemical analyses are summarized in tables 8 and 9, appendix E. The initial screening of the borings demonstrated no exceedances of the BTEX screening levels. TPHC screening values were exceeded in the eastern plume only at 43MA-93-04X.

Filtered and unfiltered metals analyses were conducted on all water samples collected from the newly installed monitoring wells. Silt and clay particles in the samples often resulted in metals levels in unfiltered samples that exceeded MCLs. To determine the level of dissolved metals, the samples were filtered. Low solubility metals (aluminum and iron) were reduced, while the soluble metals (sodium and calcium) were not significantly affected.

All of the wells exceeded screening values for aluminum, iron, manganese, and sodium in unfiltered samples. The wells with the highest aluminum and iron concentrations also had the highest concentrations of other metals, indicating a relationship between the presence of particulates and the content of metals in groundwater.

Filtered samples from these wells had lower levels of inorganics, indicating that the majority of the metals were in the suspended solids. Aluminum levels exceeded background in a few wells, which may be attributable to weathering of aluminosilicate bedrock minerals. Manganese levels were also above background in several wells. With the exception of manganese and aluminum, which occur naturally at the site, the data collected do not indicate the widespread presence of dissolved metals above background concentrations. The background level of dissolved iron was exceeded in one monitoring well, but this appeared to be localized, as samples from two nearby downgradient wells did not exceed background.

Groundwater samples from the boreholes following soil sample collection were screened in the field by analyzing for BTEX and TPHC. Two contaminant plumes (eastern and western) were defined by the field screening at AOC 43A. The contaminant distribution is similar to the general patterns noted during soil analyses. The lack of confirmation of these results by monitoring well samples implies that much of the BTEX and TPHC found during screening was sorbed on the particulates in the turbid samples collected from the bottom of the boreholes. Thus the BTEX and TPHC concentrations in the groundwater may be much lower than levels reported during the field screening.

Samples collected from monitoring wells were analyzed for TAL metals, VOCs, PAHs, explosives, and TPHC. Results of the groundwater analyses for BTEX and TPHC were significantly lower than the screening results, indicating a poor correlation. The groundwater screening samples were determined not to be representative of the groundwater conditions. Only a few VOCs were detected in groundwater. TCE was detected in three wells and exceeded its screening value once, but was not found in any wells downgradient of AOC 43A. The TCE

source is attributed to the DRMO Yard. In two monitoring wells 2-Methylnaphthalene was detected at levels exceeding screening values. This contaminant was not detected in a sample collected from one of the wells 3 months later. TPHC concentrations exceed screening values in two wells. The maximum measured concentration was 7,820 micrograms per liter (µg/L).

Explosive compounds were detected in three wells at or near the POL Storage Area. According to available information, the POL Storage Area has never treated, stored, or disposed of explosive compounds; therefore, the origin of these compounds is unknown. The detection of explosives in the groundwater correlates directly with high levels of TPHC and may not be related to explosive contamination. The rationale for this conclusion follows: At one well, intended to be down gradient of POL/DRMO Yards, the groundwater was clearly derived from local sources since it was heavily contaminated with road salt (up to 420 mg/kg of sodium), which is more than an order of magnitude greater than the average level in POL/DRMO Yards groundwater. This well showed traces of explosive-related compounds, 1,3-nitrobenze, 2-nitrotoluene, 3-nitrotoluene, 2,6-dinitrotoluene, and an estimated low level of cyclonite (less than 2 µg/L). Well 43MA93-10x, at the POL area, also showed a trace of cyclonite (0.673 µg/L). There is no site history to link the location of these wells to explosive use or storage. Both wells show high levels of TPHC and the chemists reviewing the data could not eliminate these compounds on quality assurance/quality control (QA/QC) grounds, but stated in the RI that the reported results "could be artifacts of the analytical method related to the presence of petroleum products" in these wells.

PAHs were detected in two wells. Because PAHs have high retardation factors, they move very slowly in groundwater and are readily sorbed on soils or aquifer materials. Because of their tendency to sorb, they would not be expected to move with the groundwater, except at a slow rate and in low concentrations

A complete presentation of the groundwater results can be found in section 7 of the AOC 43A final RI report.

3. Asphalt (Area of Contamination 32 only)

Fifteen asphalt samples were collected at AOC 32. Sample locations are shown in figure 4, appendix C. The samples were analyzed for pesticides and PCBs. The results of the chemical analysis are summarized in table 10, appendix E. No pesticides were detected above soil screening values. PCBs were detected in 12 samples taken in the east DRMO Yard. PCB-1248 exceeded screening values in four samples. Based on the samples with detectable PCB concentrations, the soil contamination at the DRMO Yard, and the history of site usage, there are site-related PCB contamination in the asphalt. Some of the samples with PCBs were collected in the area of the known rectifier oil spill.

4. Surface Water (Area of Contamination 32 only)

No naturally occurring surface waters are found within AOC 32. One surface water sample was collected in a catch basin, north of the East Yard. This storm drain discharges to a drainage ditch that would flow to the Plow Shop Pond. The sample was analyzed for TAL metals, TCL pesticides/PCBs, and water quality parameters. The analytical results are summarized in table 11, appendix E. Copper and lead were found to be above the screening values for chronic effects on aquatic life. Other metals were found to be elevated above background concentrations including antimony, cadmium, and zinc. Under normal runoff conditions, any discharges to the storm sewer system would percolate into the sandy soil before reaching a permanent surface water body.

5. Sediment

a. Area of Contamination 32 — The Defense Reutilization and Marketing Office Yard

Four sediment samples were collected from the storm drain system (catchment basins north of the East Yard and the storm drain outlet to the drainage ditch). Two samples were collected from further down the drainage ditch south of Shepley's Hill Landfill into which the storm drain discharges. The samples were analyzed for TCL pesticides/PCBs, TAL metals, TPHC, and total organic carbon (TOC). The analytical results are summarized in table 12, appendix E.

Both storm drain system samples exceeded background levels for metals, TOC, and TPHC. Metals of particular concern in the catchment basin were cadmium and lead. The metal concentrations were higher in storm drain discharge to the drainage ditch than in the catchment basin, probably due to sorption on organic carbon in the sediment.

The metals concentrations in the drainage ditch samples were in the same range or higher than those noted in the storm drain system. Runoff from the DRMO storm drain contributed metals to the sediment along the drainage ditch and to the groundwater recharge area. Much of the runoff percolates into the soil and recharges groundwater. The pesticide/PCB results showed DDD, DDT, and PCB-1254 in the storm drain sediments. The ditch sediments contained lindane and DDD. The PCBs may have migrated from the DRMO Yard. The low levels of pesticide may reflect historic pest control activities.

b. Area of Contamination 43A — The Petroleum, Oils, and Lubricants Storage Area

Several storm drain catch basins exist at the junction of Cook Street and Antietam Street. One catch basin is located on the southwest corner of the POL Storage Area. A storm drainage ditch originates within the Coal Pile area across Cook Street (west) from AOC 43A. Seven sediment samples were collected and analyzed for organics along Willow Brook and the associated storm

drains. All of these sediments contained moderate to high levels of organic carbon and TPHC above background. Three groups of organics were detected: PAHs, pesticides, and phthalates. Several individual compounds, such as toluene and dibenzofuran, were also detected.

There is no evidence of any specific impact from AOCs 32 or 43A on Willow Brook either via stormwater runoff or groundwater discharge. No pattern of contamination is attributable to a single source, nor are there correlations between levels of contaminants within a sample. No metals concentrations in sediments from the storm drains or Willow Brook were found to be above background levels.

6. Air (Area of Contamination 32 only)

Air samples were collected at three locations: (1) the field next to Fort Devens Elementary School, (2) near the southwest corner of the DRMO, and (3) at center of the East DRMO Yard. A collocated sample was taken at the latter location. Nine samples were collected: three VOCs, three particulate matter less than 10μ (PM_{10})/metals, and three pesticide/PCBs. The first location was considered to be background.

The results of the sample analysis are summarized in table 13 and 14, appendix E. This analysis showed no detectable concentrations or concentrations above background, with exceptions discussed as follows.

The second and third locations showed levels of PM_{10} above background, but within the range of normal ambient conditions. Unless further investigation reveals high concentrations of metals in the surface soils, no further action is warranted.

The collocated samples had measurable concentrations of the pesticide α-BHC and PCB-1248. The results, based on samples collected under less than optimum conditions, indicate that emissions of PCBs and pesticides from the DRMO are of concern if the site is left unremediated.

VI. SUMMARY OF SITE RISKS

A. Human Health Risk Assessment

A human health risk assessment was conducted to evaluate potential health risks to individuals under current or foreseeable future site conditions at AOC 32 and 43A. The risk assessment is consistent with relevant guidance and standards developed by the USEPA and incorporates data from the scientific literature used in conjunction with professional judgment.

The human health risk assessments for AOC 32 and 43A consist of the following components:

- Selecting chemicals of potential concern (COPCs)
- Assessing exposure
- Assessing toxicity
- Characterizing risk
- Evaluating uncertainty
- Developing a summary and conclusions

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively by developing several hypothetical exposure pathways. These hypothetical pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site.

1. Area of Contamination 32 — The Defense Reutilization and Marketing Office Yard and Underground Storage Tank #13

The exposure pathways evaluated for the human health risk at AOC 32 are listed below:

- Direct contact (dermal contact and incidental ingestion) with contaminants in asphalt, surface soil, or sediment (sediments were not quantitatively evaluated)
- Inhalation of contaminant vapor emissions from the asphalt and soil by site workers and visitors
- Direct contact with contaminants in subsurface soils near underground utility lines by utility workers (not quantitatively evaluated)
- Inhalation of airborne soil particles by utility workers (not quantitatively evaluated)
- Inhalation of vapors that have diffused via the soil gas to indoor air of a new building (UST #13)
- Ingestion of contaminants in drinking water

a. Surface Soil and Asphalt

The cancer risks associated with AOC 32 are listed in table 15, appendix E. The maximum estimated potential cancer risk under the case of reasonable maximum exposure (RME) to contaminants at the DRMO Yard for a site worker exposed to asphalt paving and surface soil under current conditions is 9.2×10^{-5}, which is within the acceptable range (10^{-4} to 10^{-6}). The maximum estimated potential cancer risk associated with soil and asphalt under the case of RME under future conditions, when the higher contaminated subsoil could be exposed during construction, is 1.3×10^{-4}. The cancer risks are associated with PCBs, arsenic, and beryllium.

The hazard indices for noncarcinogenic COPCs at the DRMO Yard are listed in table 16, appendix E. The only hazard index (HI) exceeding 1.0 under current site conditions is associated with the RME case of worker soil exposure. The HI for dermal absorption and ingestion is 4.4 for PCBs and 0.9 for lead.

Under future conditions associated with soils, HIs exceed 1.0 for construction workers (RME value) and site workers (RME and average values). These exceedances are primarily due to PCBs and lead and, to a lesser degree, arsenic, mercury, and chromium (assuming that 10% of the chromium in soils is hexavalent chromium).

b. Groundwater

At the DRMO Yard, the estimated cancer risk from consuming unfiltered groundwater for the RME case is 6.0×10^{-3}, which exceeds the acceptable range. Almost all of the risk is associated with ingesting arsenic and beryllium, which are found in groundwater with high suspended sediments. When metals data from filtered groundwater samples are used, the estimated cancer risk for the RME case is reduced to 5.7×10^{-5}, which is within the acceptable range.

Future consumption of filtered and unfiltered groundwater at the DRMO Yard yields HIs above 1.0. The contaminants associated with the unfiltered groundwater scenario are arsenic, manganese, and lead. The HI for filtered groundwater is solely due to manganese. However, any future use of area groundwater as a drinking water source is unlikely because of the existing public water supply system and the aquifer's low yield.

In the former UST #13 area, the estimated cancer risk from consuming unfiltered groundwater for the RME case is 5.2×10^{-3}, which exceeds the acceptable range. Almost all of the risk is associated with ingesting arsenic, with additional risk from PCBs and 1,4-dichlorobenzene. When metals data from filtered groundwater samples are used, the estimated cancer risk for the RME case is reduced to 6.2×10^{-4}.

Future consumption of filtered and unfiltered groundwater at the former UST #13 site yields HIs above 1.0. The contaminants associated with both groundwater scenarios are arsenic, PCBs, and manganese. The HI for filtered groundwater is solely due to manganese. However, any future use of area groundwater as a drinking water source is highly unlikely because of the existing public water supply system and the aquifer's very low yield.

2. Area of Contamination 43A — Petroleum, Oils, and Lubricants Storage Area

The exposure pathways evaluated for the human health risk at AOC 43A are listed below:

- Direct contact (dermal contact and incidental ingestion) with contaminants in surface soil
- Direct contact with contaminants in subsurface soils near underground utility lines by utility workers (not quantitatively evaluated)
- Inhalation of airborne soil particles by utility workers (not quantitatively evaluated)
- Ingestion of contaminants in drinking water

a. Surface Soil

The cancer risks associated with AOC 43A are listed in table 17, appendix E. The maximum estimated potential cancer risk under the case of RME to contaminants at the AOC 43A is 2.1 X 10^{-5} for a site worker under current conditions, which is within the acceptable range. For AOC 43A, most of the estimated cancer risk is due to ingestion and dermal absorption of arsenic (85%) and ingestion of carcinogenic PAHs (15%). As shown in table 18, appendix E, the noncarcinogenic HIs are less than 1.0 for the exposure scenarios under the current site conditions.

For future construction workers exposed to surface soil contaminants, estimated cancer risks are 2.2 X 10^{-5} for RME cases and 3.0 X 10^{-6} for the average case, which also fall within the acceptable range. The majority of this risk (85%) is due to arsenic. Approximately 17% of the total cancer risk is due to carcinogenic PAHs, which was considered for ingestion and inhalation pathways only. Noncancer HIs total 4.7 for the RME case and 0.75 for the average exposure case. Most of the RME total is due to ingestion and dermal absorption of arsenic, with a total HI of 4.1. Arsenic was the only COPC with an HI greater than 1.0.

b. Groundwater

At AOC 43A, estimated potential cancer risks from consuming groundwater based on data from unfiltered groundwater samples are 1.9 X 10^{-4} for the RME case (above the USEPA acceptable range), and 4.1 X 10^{-5} for the average exposure case. More than 99% of the risk is associated with ingesting beryllium. The highest concentrations of beryllium detected in unfiltered groundwater are associated with high levels of suspended sediments, levels that would not be present in groundwater actually used as drinking water.

It should be noted that the cancer slope factor (SF) for beryllium was derived from the laboratory using soluble salts; however, beryllium at the POL Storage Area is mostly in an insoluble and inactive form. Therefore, these risk estimates are probably unrealistic.

Total HIs for noncarcinogenic effects from consuming groundwater at the POL Storage Area, based on data from unfiltered groundwater samples, are 21 for the RME case and 3.9 for the average exposure case. The HI for the RME case is due to manganese (HI = 16) and lead (HI = 3.0). The measured concentration of many metals in groundwater is due to high levels of suspended sediments. Using metals from filtered groundwater, total HIs drop to 2.7 for the RME and 0.8 for the average exposure cases. Manganese was the only COPC in filtered groundwater with an HI greater than 1.0.

The highest estimated soil risks are for workers in the future, and the highest estimated groundwater risks are for unfiltered groundwater. The RME risk is mostly from ingesting groundwater. Any future use of area groundwater as a drinking water source is unlikely because of the existing public water supply system and the low yield of the aquifer. Therefore, the most realistic risks in the future are those for the site worker from potential exposure to soil contaminants alone.

B. Ecological Risk Assessment

The ecological risk assessment followed a four-step process:

- *Problem Formulation* — This section is based on information collected during the site-specific ecological characterization and hydrogeological studies, as well as the chemical data provided from the RI sampling effort. This phase of the ecological risk assessment is presented in four parts: (1) ecosystems of concern; (2) potential stressors, exposure pathways, (3) ecological affects; ecological endpoints; and (4) the conceptual model.
- *Exposure Assessment* — This section includes only site-specific information pertinent to assessing potential ecological exposures to contaminants at AOC 32. This phase of the ecological risk assessment is presented in three parts: (1) exposure point concentrations, (2) exposure scenarios and pathway, and (3) exposure estimates.
- *Ecological Effects Assessment* — This section includes site-specific information pertinent to assessing potential ecological effects of contaminants at AOC 32. This phase of the ecological risk assessment is presented in two parts: (1) toxicity reference values and (2) field studies/summary of findings.
- *Risk Characterization* — This section, which integrates the three earlier steps, summarizes the potential and actual risks posed by hazardous substances at the site. This phase of the ecological risk assessment is presented in three parts: (1) hazard quotients, (2) summary of risks and uncertainties, and (3) ecological significance.

A summary discussion of the ecological risk assessment approach is presented in volume I, section 6 of the RI report, while more detailed discussions are presented in section 9 of volumes II (DRMO Yard) and III (POL Storage Area) of the RI.

COPCs were established for the DRMO Yard (table 19, appendix E) and the POL Storage Area (table 20, appendix E).

1. Area of Contamination 32 — The Defense Reutilization and Marketing Office Yard

The only COPCs selected in the media potentially affected by activities in the DRMO Yard were cadmium and nickel in sediments of the drainage ditch. The DRMO Yard site lacks vegetation because of human activities. The site consists of paved areas that are surrounded or bordered by grass strips and a gravel parking lot. The drainage ditch is the only area of the site that is not directly affected by human activity. The ecological assessment addressed incidental contact and ingestion, as well as uptake of these contaminants in the food chain for the drainage ditch and adjacent habitats. Levels of cadmium and nickel exceed reference values for invertebrates, but these exceedances are not likely to be ecologically significant, due to the limited extent of contamination. Potential risks of contaminants to wildlife species, such as small mammals and carnivores, are minimal. Therefore, no action to further investigate or to mitigate ecological risks of sediment contamination at the site is considered to be necessary at the DRMO Yard.

2. Area of Contamination 43A — The Petroleum, Oils, and Lubricants Storage Area

A few metals and organic chemicals were detected in soils and groundwater at the POL Storage Area at levels exceeding background and ecological criteria. However, none of these contaminants are considered to be COPCs for ecological receptors due to the minimal chance of exposure. No ecologically significant receptors or pathways are present at the POL Storage Area and, therefore, no risks from site contamination were identified for this site.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Under its legal authorities, the Army's primary responsibility at NPL sites is to undertake remedial actions that protect human health and the environment. In addition, § 121 of CERCLA (42 USC 9621) establishes several other statutory requirements and preferences:

- The remedial action, when complete, must comply with all Federal and any more stringent State environmental standards, requirements, criteria, or limitations, unless a waiver is invoked.
- The remedial action must be cost-effective and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

- A preference must be given to those remedies in which treatment permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element.

Response alternatives were developed to be consistent with these mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives (RAOs) were developed to aid in developing and screening alternatives. These RAOs were developed to mitigate existing and future potential threats to human health and the environment.

The RAOs for site-related surface and subsurface soils are as follows:

- Prevent direct and indirect contact, ingestion, and inhalation of the soil contaminated with COPCs by human and ecological receptors at levels that could pose risks.
- Prevent erosion and migration of soil contaminated with COPCs to storm sewers and surface water bodies.
- Prevent COPC migration to the groundwater at levels that could adversely affect human health and the environment.

The RAOs for site-related groundwater include the following:

- Prevent off-site migration of COPCs at levels that could adversely affect flora and fauna.
- Prevent lateral and vertical migration of COPCs at levels that could adversely affect potential and existing drinking water supply aquifers.
- Prevent seepage of groundwater from the site that could result in surface water concentrations in excess of ambient water quality standards.

RAOs were not developed for surface water because it is impracticable to remediate this medium directly. Rather, surface water contamination is addressed by proactive RAOs in other media. RAOs were not developed for sediments because of minimal site effects.

B. Technology and Alternative Development and Screening

CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establish the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives were developed for AOCs 32 and 43A. The NCP reaffirms CERCLA's preference for permanent solutions that use treatment technologies to reduce the toxicity, mobility, and volume of hazardous substances to the maximum extent practicable.

With respect to soil within AOC 32, the FS developed several remedial alternatives that attain site-specific cleanup levels using different technologies, as well as institutional control and no further action alternatives. All alternatives included extended monitoring programs.

The residual soil contamination detected at UST #13 (AOC 32) was sporadic in nature, and excavation was conducted to remove all soil above screening values. Development of soil remedial alternatives was therefore deemed not to be warranted. As the soil contamination noted at AOC 43A was isolated or only marginally above cleanup goals, no remedial action program was developed.

Surface water within the DRMO Yard (AOC 32) consists of drainage runoff from the yard. Addressing contamination of the AOC 32 soils would improve the quality of the surface water. The surface water was, therefore, not considered for direct remediation.

With respect to groundwater (UST #13 and POL/DRMO), the FS developed one remedial alternative that eventually attains site-specific cleanup goals using intrinsic remediation, as well as institutional controls and no further action alternatives. This ROD will use the more descriptive name "monitored natural attenuation" in place of "intrinsic remediation." This usage is consistent with current USEPA guidance. Monitored natural attenuation is the combination of physical, chemical, and biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in soil or groundwater in a reasonable time frame. These insitu processes include biodegredation, dispersion, dilution, adsorption, volatilization, and biological and chemical stabilization or destruction of contaminants. The alternatives in the FS used monitored natural attenuation as the primary remedial action. All the alternatives included extended environmental monitoring programs.

Section 3 of the FS identified, assessed, and screened technologies and process options based on Implementability, effectiveness, and cost. In section 4 of the FS, these technologies and process options were combined into the candidate alternatives listed below for each operable unit.

1. Area of Contamination 32 — Defense Reutilization and Marketing Office Yard Soils Operable Unit

- Alternative A1: No Further Action
- Alternative A2: Institutional Actions
- Alternative A3: Containment via Capping
- Alternative A4: Excavation, Solidification, and On-site Disposal
- Alternative A6: Excavation and Off-site Disposal

2. Area of Contamination 32 — Underground Storage Tank #13 Groundwater Operable Unit

- Alternative B1: No Further Action
- Alternative B2: Institutional Actions
- Alternative B3: Monitored Natural Attenuation (with Long-Term Monitoring)

3. Area of Contamination 32 and 43A — Petroleum, Oils, and Lubricants Storage Area/Defense Reutilization and Marketing Office Yard Groundwater Operable Unit

- Alternative C1: No Further Action
- Alternative C2: Institutional Actions
- Alternative C3: Monitored natural attenuation (with Long-Term Monitoring)

The alternatives were then evaluated and screened in section 4 of the FS based on Implementability, effectiveness, and cost, as described in section 300.430(e)(4) of the NCP. From this screening process, each remedial alternative was retained for detailed analysis.

VIII. DESCRIPTION OF ALTERNATIVES

Based on preliminary information relating to the types of contaminants, environmental media of concern, and potential exposure pathways at Fort Devens, remedial alternatives for three operable units are discussed in the following sections. These operable units are soil contamination in and around the DRMO Yard (AOC 32), groundwater contamination in the area of the removed UST #13 (AOC 32), and the groundwater in the POL Storage Area/DRMO Yard (AOC 43A and 32).

This section provides a narrative summary of each alternative evaluated in detail in the FS completed for AOC 32 and AOC 43A. A detailed assessment of each alternative can be found in sections 4 and 5 of the FS report.

A. Defense Reutilization and Marketing Office Yard Soils Operable Unit (Area of Contamination 32)

Five alternatives for remediation of the DRMO soils were retained from the initial screening.

1. Alternative A1: No Further Action

This alternative does not involve remedial actions. No treatment or containment will be performed. This alternative would leave contaminated soil in place. No action would be taken to

eliminate the exposure pathways of these contaminants. Groundwater monitoring of the existing wells would be performed annually for 5 years, at which time the program would be reviewed. As required by CERCLA, Alternative A1 was developed to provide a basis of comparison for the remaining alternatives.

Total Direct and Indirect Costs:	$0
Present Worth of Operation and Maintenance (O&M) costs:	$80,380 (over 5 years)
Total Present Worth:	$80,380

2. Alternative A2: Institutional Actions

- Limit land use to restricted development through deed restrictions.
- Install approximately 60 feet of new fencing and move 840 feet of existing fencing to isolate contaminated soils in drainage ditches.
- Review site conditions every 5 years for a period of 30 years, including groundwater monitoring.

No remediation would occur under this alternative; activity would be limited to minimal measures intended to reduce exposure to the contaminants of concern. Deed restrictions would limit land use and development. The existing fencing on the east and west side of the East Yard would be modified to isolate contaminated soils in drainage ditches along the perimeter. Groundwater monitoring would be conducted once every 5 years for a period of 30 years, in conjunction with the site condition reviews. Exposure scenarios would be revisited based on site use at the time of each review. If warranted, additional action will be considered at these times.

Total Direct and Indirect Costs:	$17,950
Present Worth of O&M costs:	$64,880 (over 30 years)
Total Present Worth:	$103,690

3. Alternative A3: Containment via Capping

- Excavate and consolidate contaminated soils.
- Backfill excavated areas with clean material.
- Install a new drainage swale.
- Install a multilayered cap.
- Maintain cap and monitor groundwater annually for 30 years.
- Impose future site restrictions.

Under this alternative, direct contact with the contaminated soils and asphalt around the East Yard would be eliminated by installing an impermeable cap. The cap would minimize the

generation of contaminated groundwater. Contaminated soil is found in four areas: the southern portion of the tire storage area (north of the East Yard), the center of the East Yard, and two drainage swales along the eastern and western edges of the East Yard. The excavated soil from the swales would be placed on and between the other two contaminated areas. The multilayered clay cap would be vegetated and fenced. Annual O&M activities would be conducted for 30 years and includes repairing holes, revegetation, and groundwater monitoring.

Total Direct and Indirect Costs:	$470,320
Present Worth of O&M costs:	$366,200 (over 30 years)
Total Present Worth:	$836,520

4. Alternative A4: Excavation, Solidification, and On-Site Disposal

- Excavate the contaminated waste (1,300 cubic yards).
- Transport the waste to a temporary storage area.
- Mix the waste with a binder.
- Cure the waste for approximately 30 days.
- Transport the waste to a final disposal location.
- Sample groundwater annually for 30 years.
- Impose future site restrictions.

This alternative includes the excavation, on-site treatment via solidification, and on-site disposal of contaminated soils. Contaminated soils and asphalt (center portion of the East Yard) would be excavated using earth-moving equipment such as bulldozers, transported to the southern portion of the East DRMO Yard to await treatment, and mixed with a solidification agent (portland cement and water). The waste/binder mixture would be placed in forms and allowed to cure for up to 30 days to achieve full strength. Finally, the monoliths would be disposed of on-site. The probable location for disposal would be the northern DRMO Yard and southern tire recycling area, the areas from where the soils would be excavated. The disposal site would be covered with top soil and vegetated.

Groundwater monitoring wells would be sampled on an annual basis for a period of 30 years to evaluate potential contaminant migration. Under this alternative, the contaminants would be treated and contained but not removed from the site. Solidification is intended to address inorganic contaminants such as lead and cadmium in the soil. Physically binding large organics, such as PCBs and pesticides, would reduce the risk of exposure. Groundwater monitoring would also aid in protecting human health and the environment in because it would detect and evaluate potential contaminant migration.

Total Direct and Indirect Costs:	$490,870
Present Worth of O&M costs:	$287,270 (over 30 years)
Total Present Worth:	$778,140

5. Alternative A6: Excavation and Off-site Disposal

- Excavate the contaminated waste (1,300 cubic yards). Perform confirmatory sampling prior to backfilling.
- Transport the waste immediately to a final off-site disposal location (nonhazardous landfill).
- Backfill the area with clean material and revegetate.
- Monitor groundwater after 5 years.

Under this alternative, all soil identified as being contaminated would be excavated and disposed of off-site. Figure 7, appendix C shows the soil to be excavated. A total of 1,300 cubic yards of contaminated soil would be excavated and transferred immediately to a final off-site disposal area: a nonhazardous landfill. The excavated areas would then be regraded or backfilled to grade with clean soils and revegetated for stabilization. The southern portion of the East DRMO Yard could be used as a decontamination pad for the excavation equipment. Because the source of contamination would be removed from the site, no long-term monitoring would be required. However, a review of site conditions, including groundwater monitoring, would be conducted in 5 years to ensure that no contaminants migrate from any unidentified sources. This alternative would not treat or destroy the contaminants, but would completely remove them from the site. All three RAOs would be achieved permanently. Therefore, this alternative would provide complete protection of human health and the environment.

Total Direct and Indirect Costs:	$543,696
Present Worth of O&M costs:	$19,850
Total Present Worth:	$563,550

B. Underground Storage Tank #13 Groundwater Operable Unit (Area of Contamination 32)

Three alternatives for remediation of UST #13 groundwater were retained from the initial screening.

1. Alternative B1: No Further Action

The no further action alternative would neither contain, treat, nor destroy the contaminants in the groundwater near UST #13. Under this alternative, no remedial action of any type would be undertaken. It is assumed that the contamination would remain in its present state and pose the same risks as currently exist. Monitoring, however, would be performed to detect contaminant migration. Groundwater monitoring would be performed annually for 5 years, at which time the continuation of the program would be reviewed. This alternative would not meet the RAOs.

Total Direct and Indirect Costs:	$0
Present Worth of O&M costs:	$75,820 (over 5 years)
Total Present Worth:	$75,820

2. Alternative B2: Institutional Actions

Institutional actions would not treat or destroy any of the contaminants. No remediation would occur under this alternative. Figure 8, appendix C shows the lateral extent of this groundwater operable unit. Activity would be limited to minimal measures intended to reduce exposure to contaminated media. Deed restrictions would limit land use and development. Groundwater monitoring would be conducted once every 5 years for a period of 30 years, in conjunction with the site condition reviews. Exposure scenarios would be revisited based on site use at the time of each review. If warranted, additional action would be considered at these times. This alternative would not meet the RAOs.

Total Direct and Indirect Costs:	$0
Present Worth of O&M costs:	$58,140 (over 30 years)
Total Present Worth:	$58,140

3. Alternative B3: Monitored Natural Attenuation

The monitored natural attenuation alternative will not directly treat, contain, destroy, or reduce the mobility of contaminants. The principal components of this alternative are the assumed natural attenuation and bioremediation taking place at the site.

The key components of this alternative are as follows:

- Establish institutional controls to prevent intrusion into or installation of wells into the known area of contamination in the bedrock.
- Allow for monitored natural attenuation by naturally occurring microorganisms in the groundwater.
- Install additional groundwater monitoring wells.
- Collect and incorporate additional field data into groundwater flow and contaminant transport models.
- Perform long-term monitoring and report annually on groundwater quality.
- Review field data, modeling predictions, and compliance with applicable or relevant and appropriate requirements (ARARs) at 5-year intervals.
- Review the need for continued monitoring and additional action at 5-year intervals.

Total Direct and Indirect Costs:	$0
Present Worth of O&M costs:	$170,910 (over 30 years)
Total Present Worth:	$170,910

C. Petroleum, Oils, and Lubricants Storage Area/Defense Reutilization and Marketing Office Yard Groundwater Operable Unit (Area of Contamination 32 and 43A)

Three alternatives for remediating AOC 32 and 43A groundwater were retained from the initial screening.

1. Alternative C1: No Further Action

The no further action alternative would neither contain, treat, nor destroy the contaminants in the groundwater within the AOC 32 and 43A areas. Under this alternative, no remedial action of any type would be undertaken. It is assumed that the contamination would remain in its present state and pose the same risks as currently exist. Monitoring, however, would be performed to detect contaminant migration. Groundwater monitoring would be performed annually for 5 years, at which time the continuation of the program would be reviewed. This alternative would not meet the RAOs.

Total Direct and Indirect Costs:	$0
Present Worth of O&M costs:	$84,840 (over 5 years)
Total Present Worth:	$84,840

2. Alternative C2: Institutional Actions

Institutional actions would not treat or destroy any of the contaminants. No remediation would occur under this alternative. Activity would be limited to minimal measures intended to reduce exposure to contaminated media. Deed restrictions would limit land use and development. Groundwater monitoring would be conducted once every 5 years for a period of 30 years, in conjunction with the site condition reviews. Exposure scenarios would be revisited based on-site use at the time of each review. If warranted, additional action would be considered at these times. This alternative would not meet the RAOs.

Total Direct and Indirect Costs:	$0
Present Worth of O&M costs:	$69,460 (over 30 years)
Total Present Worth:	$69,460

3. Alternative C3: Monitored Natural Attenuation

The monitored natural attenuation alternative would not directly treat, contain, destroy, or reduce the mobility of contaminants. Figure 8, appendix C shows the lateral extent of this groundwater operable unit. The principal components of this alternative are the assumed natural attenuation and bioremediation taking place at the site. The institutional restrictions, if properly executed, prevent exposure to contaminants and reduce potential risks to human health to within acceptable levels.

The key components of this alternative are as follows:

- Establish institutional controls to prevent intrusion into or installation of wells into the known area of contamination in the bedrock.
- Allow for monitored natural attenuation by naturally occurring microorganisms in the groundwater.
- Install additional groundwater monitoring wells.
- Collect and incorporate additional field data into groundwater flow and contaminant transport models.
- Perform long-term monitoring and report annually on groundwater quality
- Review field data, modeling predictions, and compliance with ARARs at 5-year intervals
- Review the need for continued monitoring and additional action at 5-year intervals

Total Direct and Indirect Costs:	$0
Present Worth of O&M costs:	$258,870 (over 30 years)
Total Present Worth:	$258,870

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

§ 121(b)(1) of CERCLA (42 USC 9621) presents several factors that, at a minimum, the Army is required to consider in assessing alternatives. Building upon these specific statutory mandates, the NCP describes nine evaluation criteria to be used in assessing the individual remedial alternatives. The nine criteria are used to select a remedy that meets the goals of protecting human health and the environment, maintains protection over time, and minimizes untreated waste.

A detailed analysis was performed on the alternatives using the nine evaluation criteria to select a site remedy. Specific discussion regarding this analysis is provided in section 5 of each FS report. Definitions of the nine criteria are provided as follows:

Threshold Criteria

The two threshold criteria described below must be met for an alternative to be eligible for selection in accordance with the NCP:

1. *Overall Protection of Human Health and the Environment* — This criterion assesses how well an alternative, as a whole, achieves and maintains protection of human health and the environment.
2. *Compliance with ARARs* — This criterion assesses how the alternative complies with location-, chemical-, and action-specific ARARs and whether a waiver is required or justified.

Primary Balancing Criteria

The following five criteria are used to compare and evaluate the elements of alternatives that meet the threshold criteria:

3. *Long-Term Effectiveness and Permanence* — This criterion evaluates the effectiveness of the alternative in protecting human health and the environment after response objectives have been met. It considers the magnitude of residual risks and the adequacy and reliability of controls.
4. *Reduction of Toxicity, Mobility, and Volume Through Treatment* — This criterion evaluates the effectiveness of treatment processes used to reduce the toxicity, mobility, and volume of hazardous substances. It considers the degree to which treatment is irreversible and the type and quantity of residuals remaining after treatment.
5. *Short-Term Effectiveness* — This criterion examines the effectiveness of the alternative in protecting human health and the environment during the construction and implementation of a remedy until response objectives have been met. It considers the protection of the community, workers, and the environment during implementation of remedial actions.
6. *Implementability* — This criterion assesses the technical and administrative feasibility of an alternative, as well as the availability of required goods and services. Technical feasibility considers the ability to construct and operate a technology, its reliability, the ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of a remedy. Administrative feasibility considers the ability to obtain approvals from other parties or agencies and the extent of required coordination with other parties or agencies.
7. *Cost* — This criterion evaluates the capital and O&M costs of each alternative.

Modifying Criteria

The following modifying criteria are used on the final evaluation of remedial alternatives, generally after the Army has received public comments on the FS and proposed plan:

8. *State Acceptance* — This criterion considers the State's preferences or concerns about the alternatives, including comments on ARARs or the proposed use of waivers.
9. *Community Acceptance* — This criterion considers the community's preferences or concerns about the alternatives.

Following the detailed analysis of each alternative, the Army conducted a comparative analysis focusing on the relative performance of each alternative against the nine criteria. The comparative analysis of the alternatives for each AOC are summarized in the following sections.

A. Defense Reutilization and Marketing Office Yard Soils Operable Unit (Area of Contamination 32)

1. Overall Protection of Human Health and the Environment

This criterion, according to CERCLA, must be met for a remedial alternative to be chosen as a final site remedy. Alternative A1 would not provide any additional protection above that which already exists in the current zoning, fencing, and land-use plans for the site. Alternatives A2, A3, and A4 would minimize the exposure routes to human and environmental receptors, thus reducing risks to acceptable levels. Alternative A6 would remove contaminated soils to an offsite landfill, eliminating contamination at the site. All alternatives would involve some duration of groundwater monitoring to detect potential contaminant migration.

2. Compliance with Applicable or Relevant and Appropriate Requirement

CERCLA requires that the selected alternative also meet a second threshold criterion of compliance with ARARs or obtain a waiver if the criterion cannot be met. The PCB ARAR would be exceeded in all alternatives except Alternatives A6 and possibly A4. However, minimizing the exposure routes via Alternatives A2 and A3 would minimize risks for the Toxic Substances Control Act (TSCA) ARAR for PCBs, the Resource Conservation and Recovery Act (RCRA) action levels for pesticides and cadmium, and the human health risk assessment calculated cleanup goals for lead. Also, Alternatives A1, A2, and A3 would eliminate the possibility that the RCRA action-specific ARAR would apply.

3. Long-Term Effectiveness and Permanence

This criterion evaluates the magnitude of residual risk and the reliability of controls after response objectives have been met. Alternatives A1, A2, A3, and A4 require continued institutional controls. Alternatives A1 and A2 require continued control of access to the DRMO Yard, and thus are not considered to be effective in the long term. Alternative A3 requires maintaining the fence and the integrity of the cap, and Alternative A4 requires protecting the

buried monoliths. Of these alternatives, A4 would be more effective in the long term. In Alternative A6, the burden of responsibility shifts to the offsite landfill operator to ensure that the landfill integrity is upheld. However, the site risks would be eliminated in the long term. All alternatives would require monitoring well sampling to ensure that no continued contaminant migration occurs.

4. Reduction of Toxicity, Mobility, and Volume Through Treatment

This criterion evaluates whether the alternatives meet the statutory preference for treatment under CERCLA. The criterion evaluates the reduction of toxicity, mobility, or volume of contaminants and the type and quantity of treatment residuals. Alternatives A1 and A2 do not involve treatment and would not reduce toxicity, mobility, or volume of contamination. Alternatives A3 and A6 would not provide a reduction in toxicity or volume, but they would reduce the mobility of contamination. Of these two, Alternative A6 would be more effective in this reduction. Neither alternative satisfies the preference for on-site treatment. A4 would reduce the toxicity of lead and cadmium contamination, but not that of PCBs or pesticides. It would drastically reduce the mobility of these contaminants, but would likely increase the volume. Alternative A4 is the only option that would satisfy the regulatory preference for on-site treatment. Monitoring under all alternatives would serve to verify reduction in contaminant migration.

5. Short-Term Effectiveness

CERCLA requires that potential adverse short-term effects to workers, the surrounding community, and the environment be considered during selection of a remedial action. Alternative A1 would cause no disturbance of surface soil that might endanger human health. Alternative A2 would cause a brief disturbance to surface soils while fencing was installed. Alternatives A3, A4, and A6 would involve extensive short-term earth moving and remedial activities, which would require Level C personal protection equipment (PPE) to prevent worker exposure, as well as dust and runoff control activities to prevent community exposure. In addition, these three alternatives would require air monitoring during excavation activities. Under all alternatives, groundwater sampling would be performed in dermal and respiratory protection to minimize exposure risks.

6. Implementability

This criterion evaluates each alternative's ease of construction and operation and availability of services, equipment, and materials to construct and operate the alternative. Also evaluated is the ease of undertaking additional remedial actions and administrative feasibility. None of the alternatives face any technical obstacles to implementation. However, Alternatives A1, A2, and A3 would require waivers for the PCB ARAR. On the other hand, Alternatives A4 and A6 would possibly require RCRA action-specific ARARs for lead and cadmium. Alternative A4 would

require the longest time to implement, approximately 4 to 5 months. All of the alternatives except A6 would require future site-use restrictions.

7. Cost

Alternative A1 requires annual monitoring costs, of approximately $80,380 over 5 years. Alternative A2 requires minimal work and an estimated $103,690 to implement. Alternative A3 would require consolidation and capping of the soil, which could be implemented relatively easily at an estimated cost of $836,520. Alternative A4 would require slightly more time for solidification and burial, at an estimated cost of $778,140. Alternative A6 could be implemented easily and quickly for an estimated cost of $563,550.

8. State Acceptance

This criterion addresses whether, based on its review of the RI/FS and proposed plan, the State concurs with, opposes, or has no comment on the alternative the Army is proposing as the remedy for the DRMO soils operable unit (AOC 32). The Commonwealth of Massachusetts has reviewed the RI/FS, proposed plan, and this ROD and concurs with the selected remedy (see section X).

9. Community Acceptance

This criterion addresses whether the public concurs with the Army's proposed plan. No comments were received from the community during the public comment period. The Army believes this shows community acceptance of the proposed plan and selected remedy.

B. Underground Storage Tank #13 Groundwater Operable Unit (Area of Contamination 32)

1. Overall Protection of Human Health and the Environment

This criterion, according to CERCLA, must be met for a remedial alternative to be chosen as a final site remedy. Alternatives B1, B2, and B3 will not directly treat, contain, destroy, or reduce the mobility of contaminants in the UST #13 groundwater area. Alternative B1 would not provide any additional protection above that which already exists in the current zoning, fencing, and land-use plans for the site. Alternative B2 would minimize the exposure routes to human and environmental receptors by isolating the AOC by development restrictions, thus reducing risks to acceptable levels. Alternative B3, in conjunction with institutional controls, will provide good data on contaminant migration and the potential for human health risks outside the controlled

area. All alternatives would involve some duration of groundwater monitoring to detect potential contaminant migration.

2. Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA requires that the selected alternative also meet a second threshold criterion of compliance with ARARs or obtain a waiver if the criterion cannot be met. The chlorobenzene ARAR would be exceeded in all alternatives except Alternative B3, where the groundwater would eventually comply with the ARAR. Minimizing the exposure routes via Alternatives B2 and B3 would minimize risks for the Safe Drinking Water Act (SDWA) ARAR for chlorobenzene.

3. Long-Term Effectiveness and Permanence

This criterion evaluates the magnitude of residual risk and the reliability of controls after response objectives have been met. Under Alternatives B1 and B2, the potential for human and ecological exposure to contaminants in groundwater endure. These alternatives do not satisfy the preference for treatment and permanence. Alternatives B2 and B3 require continued institutional controls. In Alternative B3 (the microbial degradation process of monitored natural attenuation), the organic COPCs would ultimately be converted to inert compounds such as carbon dioxide, methane, and water. Inorganic COPCs would persist after completion of organic degradation but may be naturally occuring. Because of the actual degradation/destruction of organic contaminants that occurs in this process, intrinsic bioremediation provides permanent treatment effectiveness without secondary waste disposal. Alternative B3, if successful, would provide a permanent and effective long-term remediation of the site. All alternatives would require monitoring well inspection.

4. Reduction of Toxicity, Mobility, and Volume Through Treatment

This criterion evaluates whether the alternatives meet the statutory preference for treatment under CERCLA. The criterion evaluates the reduction of toxicity, mobility, or volume of contaminants and the type and quantity of treatment residuals. Alternatives B1 and B2 do not involve treatment and would not reduce toxicity, mobility, or volume of contamination. Alternative B3 meets the statutory preference for treatment under CERCLA because monitored natural attenuation is a naturally occurring treatment. Monitoring under all alternatives would serve to verify reduction in contaminant migration. Alternative B3 proposes more intensive monitoring to determine whether the expected results are or are not attained.

5. Short-Term Effectiveness

CERCLA requires that potential adverse short-term effects to workers, the surrounding community, and the environment be considered during selection of a remedial action. No alternative will have any significant impact on existing site conditions. Under all alternatives, groundwater sampling would be performed in dermal and respiratory protection to minimize exposure risks.

6. Implementability

This criterion evaluates each alternative's ease of construction and operation, as well as availability of services, equipment, and materials to construct and operate the alternative. None of the alternatives face any technical obstacles to implementation. However, Alternatives B1 and B2 would require waivers for the chlorobenzene ARAR. Alternative B3 has the ultimate objective of meeting ARARs and poses no apparent administrative obstacles.

7. Cost

Capital, O&M, and present worth costs were estimated for Alternatives B1 through B3. Cost estimates for these alternatives included similar expenses for long-term groundwater monitoring. As would be expected, Alternatives B1 and B3 are the least and most expensive alternatives, respectively. The only alternative with capital costs is B3. These expenditures are designated for installing additional monitoring wells and creating and calibrating a site-specific flow and contaminant transport model. The O&M costs associated with Alternative B3 include the potential adjustment of the site-specific model.

8. State Acceptance

This criterion addresses whether, based on its review of the RI/FS, and proposed plan, the State concurs with, opposes, or has no comment on the alternative the Army is proposing as the remedy for the UST #13 Groundwater Operable Unit (AOC 32). The Commonwealth of Massachusetts has reviewed the RI/FS, proposed plan, and this ROD and concurs with the selected remedy (see section XIII).

9. Community Acceptance

This criterion addresses whether the public concurs with the Army's proposed plan. No comments were received from the community during the public comment period. The Army believes this shows community acceptance of the proposed plan and selected remedy.

C. Petroleum, Oils, and Lubricants Storage Area/Defense Reutilization and Marketing Office Yard Groundwater Operable Unit (Area of Contamination 32 and 43A)

1. Overall Protection of Human Health and the Environment

This criterion, according to CERCLA, must be met for a remedial alternative to be chosen as a final site remedy. Alternatives C1, C2, and C3 will not directly treat, contain, destroy, or reduce the mobility of contaminants in the POL/DRMO groundwater area. Alternative C1 would not provide any additional protection above that which already exists in the current zoning, fencing, and land-use plans for the site. Alternative C2 would minimize the exposure routes to human and environmental receptors by isolating the area of contamination though development restrictions, thus reducing risks to acceptable levels. Alternative C3, in conjunction with institutional controls, will provide good data on contaminant degradation migration and the potential for human health risks outside the controlled area. All alternatives would involve some duration of groundwater monitoring to detect potential contaminant migration.

2. Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA requires that the selected alternative also meet a second threshold criterion of compliance with ARARs or obtain a waiver if the criterion cannot be met. The ARARs for petroleum hydrocarbons would be exceeded in all alternatives except Alternative C3, where the groundwater would eventually comply with the ARARs. Institutional controls contained in Alternatives C2 and C3 would minimize exposure routes and thereby risks associated with the ARARs for TCE and methyl naphthalene.

3. Long-Term Effectiveness and Permanence

This criterion evaluates the magnitude of residual risk and the reliability of controls after response objectives have been met. Under Alternatives C1 and C2, the potential for human and ecological exposure to contaminants in groundwater endure. These alternatives do not satisfy the preference for treatment and permanence. Alternatives C2 and C3 require continued institutional controls. In the C3 alternative (microbial degradation process of monitored natural attenuation), the organic COPCs are converted ultimately to inert compounds such as carbon dioxide, methane, and water. Inorganic COPCs will continue to exist following completion of organic degradation but are thought to be of natural origin (except for sodium from road salt). Because of the actual degradation/destruction of organic contaminants that occurs in this process, intrinsic bioremediation provides permanent treatment effectiveness without secondary waste disposal. Alternative C3, if successful, would be a permanent and effective long-term remediation of the site. All alternatives would require monitoring well inspection.

4. Reduction of Toxicity, Mobility, and Volume Through Treatment

This criterion evaluates whether the alternatives meet the statutory preference for treatment under CERCLA. The criterion evaluates the reduction of toxicity, mobility, or volume of contaminants and the type and quantity of treatment residuals. Alternatives C1, C2, and C3 do not involve treatment and would not reduce toxicity, mobility, or volume of contamination. Alternative C3 meets the statutory preference for treatment under CERCLA because monitored natural attenuation is a naturally occurring treatment. Monitoring, under all alternatives, would serve to verify reduction in contaminant migration. Alternative C3 proposes more intensive monitoring to determine whether the expected results are or are not attained.

5. Short-Term Effectiveness

CERCLA requires that potential adverse short-term effects to workers, the surrounding community, and the environment be considered during selection of a remedial action. No alternative will have any significant impact on existing site conditions. Under all alternatives, groundwater sampling would be performed in dermal and respiratory protection to minimize exposure risks.

6. Implementability

This criterion evaluates each alternative's ease of construction and operation and availability of services, equipment, and materials to construct and operate the alternative. None of the alternatives face any technical obstacles to implementation. However, Alternatives C1 and C2 would require waivers for the TCE and methyl naphthalene ARARs. Alternative C3 has the ultimate objective of meeting ARARs and poses no apparent administrative obstacles.

7. Cost

Capital, O&M, and present worth costs were estimated for Alternatives C1 through C3. Cost estimates for these alternatives included similar expenses for long-term groundwater monitoring. Alternatives C1 and C3 are the least and most expensive alternatives, respectively. The only alternative with capital costs is C3. These expenditures are designated for installing additional monitoring wells and creating and calibrating a site-specific flow and contaminant transport model. The O&M cost associated with Alternative C3 includes the potential adjustment of the site-specific model.

8. State Acceptance

This criterion addresses whether, based on its review of the RI/FS and proposed plan, the State concurs with, opposes, or has no comment on the alternative the Army is proposing as the remedy for the POL/DRMO groundwater operable unit (AOC 32 and 43A). The Commonwealth of Massachusetts has reviewed the RI/FS, proposed plan, and this ROD and concurs with the selected remedy (see section XIII).

9. Community Acceptance

This criterion addresses whether the public concurs with the Army's proposed plan. No comments were received from the community during the public comment period. The Army believes this shows the community's acceptance of the proposed plan and selected remedy.

X. THE SELECTED REMEDY

The selected remedy to address surface soil contamination at AOC 32 is Alternative A6. The selected remedies to address groundwater contamination at AOC 32 (UST #13) and AOCs 32 and 43A (POL/DRMO) are Alternatives B3 and C3, respectively. Each of these alternatives includes components for monitoring contaminant degradation and contaminant migration. The remedial components of the selected remedy are described in detail as follows.

A. Surface Soil Cleanup Levels (Defense Reutilization and Marketing Office Yard Soils Operable Unit — Area of Contamination 32)

Table 21 presents the main post soil cleanup goal determination. For all contaminants except PCBs, the values calculated from the risk assessment were used as candidate cleanup goals. For PCBs, an ARAR that existed from TSCA was selected as the cleanup goal. For any compounds not addressed by these two sources, the lower value of the USEPA Region III risk-based concentrations (RBCs) or the RCRA corrective action levels was selected as the candidate cleanup goal. If these values were below the background concentration, the background level was established as the cleanup goal.

At the DRMO Yard, several samples exceeded cleanup goals at the northern perimeter and on the surface of the asphalt yard. Lead was the most consistently-detected contaminant at levels up to 2,260 mg/kg. Cadmium was detected above cleanup goals in three samples, with a maximum of 78.0 mg/kg. PCBs were also widespread, with individual species up to 5.22 mg/kg in the soil and 9.3 mg/kg in asphalt samples. DDT and its degradation products, DDD and DDE, exceeded cleanup goals in two samples located in the northeast corner of the DRMO yard.

Arsenic exceeded cleanup goals in two samples, but the concentrations were near the background range, and the conservative risk estimate of just above 10^{-5} is within the USEPA's acceptable range.

The total estimated volume of contaminated soil requiring remediation is approximately 1,300 cubic yards. Four areas require remediation: the southwestern portion of the tire storage area (500 cubic yards), the center portion of the East DRMO yard (330 cubic yards), the western drainage swale (220 cubic yards), and the eastern drainage swale (250 cubic yards). The depth of contamination in the four areas is estimated to be 1 foot.

B. Groundwater Cleanup Levels

Table 22 presents the main post groundwater cleanup goal determination Where available, the most stringent of the ARARs was selected as a potential candidate cleanup goal. If no ARAR was available, the site-specific risk value was selected. If site-specific risk values were not established, then the most stringent of the USEPA Office of Drinking Water Health Advisories (HAs), USEPA Region III tap water criteria, or the MADEP Office of Research and Standards Guidance (ORSG) for chemicals for which Massachusetts MCLs (MMCLs) have not been promulgated was selected. If measured concentrations were below background levels, the background concentration was established as the candidate cleanup goal. For inorganic contaminants, data from filtered samples were used to develop cleanup goals. Risk based clean-up levels will be established for extractable petroleum hydrocarbons/volatile petroleum hydrocarbons (EPH/VPH) during the "Monitored Natural Attenuation Remediation Assessment."

1. Underground Storage Tank #13 Groundwater Operable Unit (Area of Contamination 32)

COPCs in the source area groundwater exceeded several Federal and State drinking water standards. In the source area groundwater, the following COPCs were detected at concentrations above a Federal or State standard: 1,2-, 1,3-, and 1,4-dichlorobenzene; Aroclor 1260; DDT; 1,2-dichloroethylene (DCE); and TCE. In addition, benzene was detected just below the MCL. This plume has not migrated far because it is present in a low permeability bedrock aquifer that has a very low hydraulic gradient.

Although bis(2-ethylhexyl)phthalate was detected in one well at approximately seven times the groundwater standard, contamination is believed to be due to sample handling.

Dissolved metals, including arsenic and iron, exceeded groundwater standards. The arsenic contamination is associated with the former UST activities but does not appear to have migrated off site. Iron does not pose a risk to human health. Metals therefore were not considered for remediation.

2. Petroleum, Oils, and Lubricants Storage Area/Defense Reutilization and Marketing Office Yard Groundwater Operable Unit (Area of Contaminations 32 and 43A)

Three wells at the POL Storage Area exceeded cleanup levels for dissolved aluminum, iron, and sodium. The first two metals are considered to be naturally occurring. The source of sodium is the winter salting of the roadway, which is ongoing and not subject to regulation. One thallium sample (1 μg/L) exceeded the cleanup goal (0.5 μg/L). These metals were not slated for remediation.

Two wells in the center of the POL area had 1,3,5-trinitrobenzene (TNB) concentrations of 2.18 and 3.03 μg/L, above the TBC-based cleanup goal of 1.8 μg/L. One downgradient well exceeded the TBC-based cleanup goal for 1,3-dinitrobenzene (DNB) and showed extremely elevated chloride concentrations (600 to 800 mg/L). DDT and BHC also exceeded cleanup goals in the same well. The contamination in this well does not appear to be from the POL site.

Two wells upgradient of the DRMO Yard had dissolved manganese concentrations of 7,000 and 7,700 μg/L. Three wells located between the DRMO Yard and POL area contained low levels of TCE. Only well POL-3 exceeded cleanup goals for TCE (5 μg/L) at concentrations of 15 to 19 μg/L. Although it is apparent that the contamination came from the DRMO Yard, there is no apparent continuing source, nor does it appear that TCE is migrating downgradient. The levels of contamination are only slightly above MCLs, but the extent of contamination has not been established.

C. Description of Remedial Components

1. Defense Reutilization and Marketing Office Yard Soils Operable Unit (Area of Contamination 32)

Alternative A6: Excavation and Offsite Disposal

Under Alternative A6, all soil identified as being contaminated would be excavated and disposed of off site in a nonhazardous industrial landfill. Because of the absence of RCRA hazardous wastes (listed or characteristic) and the relatively low concentrations of PCBs (less than 50 mg/kg), the soil does not need to go to a RCRA- or TSCA-regulated landfill. If hazardous waste is found, RCRA Subtitle C will apply, and the waste will be properly disposed. Backfilling may not be required because the contaminated soils are mostly surficial. Regrading may be sufficient for handling any of the deeper areas of excavation and for generally smoothing out the excavated area. This alternative would not treat or destroy the contaminants, but would completely remove them from the site. All three RAOs would be achieved permanently. Therefore, this alternative would provide complete protection of human health and the environment. Key components of this alternative include the following:

- Excavate the contaminated waste (1,300 cubic yards). Perform onfirmatory sampling prior to backfilling.
- Transport the waste immediately to a final off-site disposal location (nonhazardous landfill).
- Backfill the area with clean material and revegetate.
- Monitor groundwater and review the site after 5 years.

Each of these components is described in the following paragraphs.

Excavate Contaminated Waste. The contaminated soils are currently found in four areas: the southern portion of the tire storage area, adjacent to the northern border of the DRMO Yard, the center of the East Yard, the drainage swale along the western edge of the yard, and the drainage swale along the eastern edge of the yard. Based on an interpretation of the soil sampling data collected during the RI, approximately 1,300 cubic yards of soil need to be excavated. Since the contaminated material is not located in a vegetated area, clearing and grubbing would not be required. Contaminated soils and the asphalt, located in the center portion of the East Yard, would be excavated using conventional earth-moving equipment such as backhoes, bulldozers, and dump trucks. The asphalt would have to be broken into pieces small enough for handling. Level C PPE would be required for site workers to prevent inhalation, ingestion, and dermal exposure routes. Dust control measures would be employed.

During excavation, verification sampling would be required to ensure that cleanup goals were achieved. This verification would involve collecting soil samples from the bottom and edges of the excavation areas and analyzing the samples for site-specific cleanup goal parameters (PCBs, pesticides, lead, and cadmium). If sample results exceed cleanup goals, then additional soil would be excavated and the excavation resampled. If results were acceptable, the excavation for that area would be considered to be complete and the area would be prepared for backfilling. As the material would be removed from the site immediately, a staging area would not be necessary.

The southern portion of the east DRMO Yard could be used as a decontamination pad for the excavation equipment. Wastewater generated from decontamination procedures would be contained, treated, and disposed of, if necessary.

Transport the Waste Immediately to a Final Off-site Disposal Location. The excavated soil would undergo toxicity characteristic leaching procedure (TCLP) testing for lead and cadmium. If the material failed the TCLP, it would be transported to an offsite, RCRA-regulated landfill. If the material passed the TCLP, it would be transported to a nonhazardous industrial landfill for final disposal.

Backfill the Area with Clean Material and Revegetate. If verification sample results are acceptable, the excavation for that area would be considered to be complete and the area would

be prepared for backfilling. The excavated areas would be regraded or backfilled to grade with clean soils and revegetated for stabilization.

Monitor Groundwater and Review the Site After 5 Years. Because the source of contamination would be removed, no long-term monitoring would be required. However, a review of site conditions, including groundwater monitoring, would be conducted in 5 years to ensure that no contaminants continue to migrate from unidentified sources. Appropriate action would be considered at that time.

2. Underground Storage Tank #13 Groundwater Operable Unit (Area of Contamination 32)

Alternative B3: Monitored Natural Attenuation

The monitored natural attenuation approach relies on natural attenuation to remediate contaminants in the subsurface. Because it relies on slow, natural processes and involves long-term monitoring to observe the gradual, natural restoration of the site to precontamination conditions, it necessarily involves institutional action. The Army will follow the *Technical Protocol for Implementing Intrinsic Remediation with Long-Term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater.* This document was codeveloped by the USEPA and the Air Force Center for Environmental Excellence and published on November 11, 1995. During the period of restoration, access to the site for some uses, such as water supply, would be restricted, since the groundwater contaminant levels exceed ARARs. Monitored natural attenuation is differentiated from institutional action by the degree of site characterization, modeling of the groundwater flow and contaminant migration, and the long-term monitoring effort to ensure that natural attenuation is working. Key components of this alternative are as follows:

- Establish institutional controls to prevent intrusion into or installation of wells into the known area of contamination in the bedrock.
- Allow for monitored natural attenuation by naturally occurring microorganisms in the groundwater within the bedrock.
- Install additional groundwater monitoring wells.
- Collect and incorporate additional field data into groundwater flow and contaminant transport models.
- Monitor groundwater over the longterm and annually report on groundwater quality.
- Review field data, modeling predictions, and compliance with ARARs at 5-year intervals.
- Review the need for continued monitoring and additional action at 5-year intervals.

Each of these components is described in the following paragraphs.

Establish Institutional Controls. Deed restrictions would limit land use and development. The land would be limited to restricted development, including a ban on drinking water well installation. The land is currently slated for industrial use by the Massachusetts Government Land Bank (November 1996 Devens Reuse Plan), which will control development upon the Army's release of the property. Therefore, no further zoning alterations would be required.

Allow for Monitored Natural Attenuation. Naturally occurring bioremediation is expected to reduce the compounds present in the bedrock beneath the site to protoplasm, carbon dioxide, water, and chlorides by a combination of physical, chemical, and biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater in a reasonable timeframe (maximum 30-years). These insitu processes include biodegredation, dispersion, dilution, adsorption, volatilization, and biological and chemical stabilization or destruction of contaminants.

Install Additional Groundwater Monitoring Wells. Additional groundwater monitoring wells will be required to improve data collection coverage within the source area, as well as downgradient of the site. The ultimate number and location of additional wells selected for long-term groundwater monitoring will depend on the results of the fate and transport modeling. A long-term monitoring plan would be developed as part of the monitored natural attenuation remediation assessment and would undergo regulatory review. These wells would be used to monitor contaminant plume location and concentration in relation to the AOC boundary and to collect intrinsic degradation indicators. To estimate costs for this alternative, it was estimated that three additional shallow wells would be necessary.

Collect and Incorporate Additional Field Data into Groundwater Models. Prior to refining a long-term groundwater monitoring plan, additional data collection and modeling may be required. Data collection may consist of installing additional monitoring wells and performing additional rounds of groundwater sampling and analysis to refine estimates of monitored natural attenuation effectiveness in protecting downgradient receptors. A monitored natural attenuation assessment work plan would be developed and provided for regulatory review. Data collected would include groundwater elevation, monitored natural attenuation indicators, and relevant COPCs, including TPHC by MADEP method for EPH and VPH. Monitored natural attenuation indicator data would be used to provide additional evidence that monitored natural attenuation is occurring and to determine future intrinsic bioremediation potential. Relevant COPC concentration data, including VPH/EPH via MADEP methods would directly assist in estimating site-specific degradation rates and the effectiveness of monitored natural attenuation in achieving groundwater cleanup goals.

Monitor Groundwater Over the Longterm and Annually Report on Groundwater Quality. Long-term groundwater monitoring is proposed to assess the monitored natural attenuation progress and detect any potential migration of contaminants that exceed groundwater cleanup levels. Groundwater monitoring would be conducted annually for 30 years or until groundwater contamination has been reduced to acceptable levels.

If the monitored natural attenuation assessment results at AOC 43A indicate that the groundwater contaminant plume can not be remediated within 30 years, an additional clean-up action will be evaluated and implemented as appropriate. If at any time during the monitored natural attenuation there is an indication that the contaminants are migrating into the currently established Zone II boundary or an area located sufficiently inside the boundary in which compliance will be determined, according to clean-up criteria stated in the Record of Decision, that a minimum will meet drinking water standards; then the Army will implement an additional remedial action which will be protective of human health and the environment.

The point of compliance for this site shall be the currently established groundwater Zone II boundary. Monitoring points shall be established at areas sufficiently inside the boundary to provide adequate time to evaluate the need for more aggressive actions to protect human health and the environment. Specific details will be provided in the Monitored Natural Attenuation Assessment Work Plan to be submitted after ROD finalization.

The Army may request a reduction in the frequency of groundwater monitoring if warranted by site conditions. Annual monitoring would be required unless USEPA and MADEP agree to a reduced frequency. A long term groundwater monitoring plan would be developed by the Army and provided for regulatory review. Likely analytical parameters for the monitored natural attenuation assessment are provided in table 23, appendix E. Annual reports would be submitted to USEPA and MADEP and would include a description of site activities, a summary of the long-term groundwater monitoring program results, and any modeling updates.

Review Field Data, Modeling Predictions, and Compliance with ARARs at 5-Year Intervals. Under CERCLA § 121(c) (42 USC 9621), any remedial action that results in contaminants remaining on-site must be reviewed at least every 5 years. During 5-year reviews, the existing data, monitoring program, and model predictions are evaluated and modified, as necessary. Whether the implemented remedy continues to be protective of human health and the environment or if the implementation of additional remedial action is appropriate are assessed.

The 5-year review would evaluate the alternative's effectiveness (compliance with ARARs) at reducing potential human health risk from exposure to groundwater on-site and downgradient, considering current and potential future receptors. This evaluation would be based on how successful the alternative is at attaining groundwater cleanup levels at the long-term monitoring wells.

Review the Need for Continued Monitoring and Additional Action at 5-year Intervals. Details were provided in the previous subsection and will not be repeated here.

3. Petroleum, Oils, and Lubricants Storage Area/Defense Reutilization and Marketing Office Yard Groundwater Operable Unit (Area of Contaminations 32 and 43A)

Alternative C3: Monitored Natural Attenuation

The monitored natural attenuation approach relies on natural attenuation to remediate contaminants in the subsurface. Because it relies on slow, natural processes and involves long-term monitoring to observe the gradual natural restoration of the site to precontamination conditions, it necessarily involves institutional action. During the period of restoration, access to the site for some uses, such as water supply, would be restricted, since the groundwater contaminant levels exceed ARARs. Monitored natural attenuation is differentiated from institutional action by the degree of site characterization, modeling of the groundwater flow and contaminant migration, and the long-term monitoring effort to ensure that natural attenuation is working. Key components of this alternative are as follows:

- Establish institutional controls to prevent intrusion into or installation of wells into the known area of contamination.
- Allow for monitored natural attenuation by naturally occurring microorganisms in the groundwater.
- Install additional groundwater monitoring wells.
- Collect and incorporate additional field data into groundwater flow and contaminant transport models.
- Monitor groundwater over the longterm and annually report on groundwater quality.
- Review field data, modeling predictions, and compliance with ARARs at 5-year intervals.
- Review of the need for continued monitoring and additional action at 5-year intervals.

Each of these components is described in the following paragraphs.

Establish Institutional Controls. Deed restrictions would limit land use and development. The land would be limited to restricted development, including a ban on drinking water well installation. The land is currently slated for rail, industrial, and trade-related uses by the Massachusetts Government Land Bank (November 1996 Devens Reuse Plan), which will control development upon Army release of the property. Therefore, no further zoning alterations would be required.

Allow for Monitored Natural Attenuation. Naturally occurring bioremediation is expected to reduce the compounds beneath the site to carbon dioxide, water, and chlorides, by reductive dechlorination and metabolism of nonchlorinated contaminants concentration in a reasonable timeframe (maximum 30-years).

Install Additional Groundwater Monitoring Wells. Additional groundwater monitoring wells will be required to improve data collection coverage within the source area, as well as downgradient of the site. The ultimate number and location of additional long-term groundwater monitoring

wells will depend on the results of the fate and transport modeling. These wells would be used to monitor contaminant plume location and concentration in relation to the AOC boundary and to collect intrinsic degradation indicators. To estimate the costs for this alternative, it was estimated that three additional shallow wells would be necessary.

Collect and Incorporate Additional Field Data into Groundwater Models. Prior to installing additional long-term groundwater monitoring wells and refining a long-term groundwater monitoring plan, additional data collection and modeling may be required. Data collection may consist of installing bedrock wells and performing an additional round of groundwater sampling and analysis to refine estimates of monitored natural attenuation effectiveness in protecting downgradient receptors. Data collected would include groundwater elevation, monitored natural attenuation indicators, and relevant COPCs. Monitored natural attenuation indicator data will be used to provide additional evidence that monitored natural attenuation is occurring and to determine future intrinsic bioremediation potential. Relevant COPC concentration data will directly assist in estimating site-specific degradation rates and the effectiveness of monitored natural attenuation in achieving groundwater cleanup goals.

Monitor Groundwater Over the Longterm and Annually Report on Groundwater Quality. Long-term groundwater monitoring is proposed to assess the progress monitored natural attenuation and detect any potential migration of contaminants that exceed groundwater cleanup levels. Depending on the results of the fate and transport modeling, groundwater monitoring would be conducted on an annual basis and reviewed under the site review for any necessary modifications.

If the monitored natural attenuation assessment results at AOC 32 and 43A indicate that the groundwater contaminant plume can not be remediated within 30 years, an additional clean-up action will be evaluated and implemented as appropriate. If at any time during the monitored natural attenuation there is an indication that the contaminants are migrating into the currently established Zone II boundary or an area located sufficiently inside the boundary in which compliance will be determined, according to clean-up criteria stated in the Record of Decision, that a minimum will meet drinking water standards; then the Army will implement an additional remedial action which will be protective of human health and the environment.

The point of compliance for this site shall be the currently established groundwater Zone II boundary. Monitoring points shall be established at areas sufficiently inside the boundary to provide adequate time to evaluate the need for more aggressive actions to protect human health and the environment. Specific details will be provided in the Monitored Natural Attenuation Assessment Work Plan to be submitted after ROD finalization.

Annual reports would be submitted to USEPA and MADEP and would include a description of site activities, a summary of the long-term groundwater monitoring program results, and any modeling updates.

Review Field Data, Modeling Predictions and Compliance with ARARs at 5-Year Intervals. Under CERCLA § 121(c) (42 USC 9621), any remedial action that results in contaminants remaining on-site must be reviewed at least every 5 years. During 5-year reviews, the existing data, monitoring program, and model predictions are evaluated and modified, as necessary. Whether the implemented remedy continues to be protective of human health and the environment or if the implementation of additional remedial action is appropriate are assessed.

The 5-year review would evaluate the alternative's effectiveness (compliance with ARARs) at reducing potential human health risk from exposure to groundwater on-site and downgradient, considering current and potential future receptors. This evaluation would be based on how successful the alternative is at attaining groundwater cleanup levels at the long-term monitoring wells.

Review the Need for Continued Monitoring and Additional Action at 5-year Intervals. Details were provided in the previous subsection and will not be repeated here.

XI. STATUTORY DETERMINATIONS

The selected remedies for DRMO Soils Operable Unit (AOC 32), UST #13 Groundwater Operable Unit (AOC 32), and POL Storage Area/DRMO Yard Groundwater Operable Unit (AOCs 32 and 43A) (Alternative A6, Alternative B3, and Alternative C3, respectively) are consistent with CERCLA and, to the extent practicable, the NCP. The selected remedies are protective of human health and the environment, attain ARARs, and are cost-effective. The remedies use permanent solutions and alternative treatment technologies to the maximum extent practicable for this site.

A. The Selected Remedy is Protective of Human Health and the Environment

The alternatives chosen for AOC 32 and 43A will permanently reduce the risks to human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through engineering and institutional controls. The principal soil threat at AOC 32 is exposure of site workers to contaminated soil. The contaminated soil will be removed and disposed of off-site. The principal groundwater threat at AOC 32 and 43A is potential consumption of unfiltered contaminated groundwater. The reuse of these portions of Devens will be controlled by zoning and deed restrictions, which would prevent the use of groundwater from the contaminated aquifer, resulting in reduced potential for exposure.

B. The Selected Remedy Attains Applicable or Relevant and Appropriate Requirements

The selected remedies will attain all applicable or relevant and appropriate Federal and State requirements. No waivers are required. ARARs for the selected remedial alternatives were identified and discussed in the final FS (sections 2 and 5). Environmental laws from which ARARs for the selected remedial action are derived and specific ARARs are summarized in table 24 and 25, appendix E.

C. The Selected Remedy is Cost-Effective

In the Army's judgment, the selected remedies are cost-effective (i.e., the remedies afford overall effectiveness proportional to costs). In selecting these remedies, once the Army identified alternatives that protect human health and the environment and that attain ARARs, the Army evaluated the overall effectiveness of each alternative according to a combination of the relevant criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. The relationship of the overall effectiveness of these remedial alternatives was determined to be proportional to costs.

The costs of the selected remedy, Alternative A6, for soils at AOC 32 in 1996 dollars are as follows:

Estimated Capital Cost:	$543,696
Estimated O&M Cost:	$19,850
Estimated Total Cost:	$563,550
Estimated Time for Restoration:	Approximately 5 months for engineering evaluations, design, excavation, and disposal

The costs of the selected remedy, Alternative B, for groundwater at AOC 32 (UST #13) in 1996 dollars are as follows:

Estimated Capital Cost:	$0
Estimated O&M Cost:	$170,910
Estimated Total Cost:	$170,910
Estimated Time for Restoration:	Approximately 12 months for engineering evaluations, design, and construction

The costs of the selected remedy, Alternative C3, for groundwater at AOCs 32 and 43A (POL Storage Area/DRMO Yard) in 1996 dollars are as follows:

Estimated Capital Cost:	$0
Estimated O&M Cost:	$258,870
Estimated Total Cost:	$258,870
Estimated Time for Restoration:	Approximately 12 months for engineering evaluations, design, and construction

D. The Selected Remedy Uses Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable.

Once the Army identified those alternatives that attain ARARs and that are protective of human health and the environment, the Army determined which alternative made use of permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provided the best balance of trade-offs among alternatives in terms of (1) long-term effectiveness and permanence; (2) reduction of toxicity, mobility, and volume through treatment; (3) short-term effectiveness; (4) implementability; and (5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility, and volume through treatment and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and State acceptance. The selected remedies provided the best balance of trade-offs among the alternatives.

1. Defense Reutilization and Marketing Office Yard Soils Operable Unit (AOC 32)

Alternative A1 would not provide any additional protection above that which already exists. Alternatives A2, A3, and A4 minimize the exposure routes, thus reducing risks to acceptable levels. Alternative A6 eliminates contamination at the site.

The PCB ARAR would be exceeded in all alternatives except Alternatives A6 and possibly A4. Alternatives A2 and A3 would minimize risks for the TSCA ARAR for PCBs, the RCRA action levels for pesticides and cadmium, and the cleanup goals for lead. Also, Alternatives A1, A2, and A3 would eliminate the RCRA action-specific ARAR.

Alternatives A1, A2, A3, and A4 require continued institutional controls. Alternatives A1 and A2 require continued control of access to the DRMO yard. Alternative A3 and A4 require extended maintenance of the site. Alternative A6 is effective in the longterm, as the burden of responsibility shifts to the off-site landfill operator to ensure that the landfill integrity is upheld.

Alternatives A1 and A2 do not involve treatment and would not reduce toxicity, mobility, or volume of contamination. Alternatives A3 and A6 would not provide a reduction in toxicity or volume, but would reduce the mobility of contamination. Of these two, Alternative 6 would be

more effective in this reduction. Neither Alternative A3 or A6 satisfies the preference for onsite treatment. Alternative A4 is the only option that would satisfy the regulatory preference for on-site treatment. Alternative A4 would reduce the toxicity of lead and cadmium contamination, but would only affect (dramatically reduce) the mobility of PCBs and pesticides. This alternative would probably increase the volume of the wastes.

Alternatives A1 and A2 would have little or no short-term impact. Alternatives A3, A4, and A6 would involve extensive short-term site disturbance.

2. Underground Storage Tank #13 Groundwater Operable Unit (Area of Contamination 32)

Alternatives B1 and B2 do not involve any remedial action, and no relevant ARARs would be satisfied. Alternative B3 provides for better safeguards in that the distribution of contaminants is more extensively characterized and monitored. It ensures that the site eventually complies with ARARs. Both Alternatives B2 and B3 require institutional controls. Only Alternative B3 meets the statutory preference for treatment because monitored natural attenuation is a naturally occurring treatment.

3. POL Storage Area/DRMO Yard Groundwater Operable Unit (AOCs 32 and 43A)

Alternatives C1 and C2 do not involve any remedial action, and no relevant ARARs would be satisfied. Alternative C3 provides for better safeguards in that the distribution of contaminants is more extensively characterized and monitored. It ensures that the site eventually complies with ARARs. Both Alternatives C2 and C3 require institutional controls. Only Alternative C3 meets the statutory preference for treatment because monitored natural attenuation is a naturally occurring treatment.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Army presented a proposed plan (preferred alternative) for remediation of soil contamination at AOC 32 and groundwater contamination at AOCs 32 and 43A at a public meeting held on July 17, 1997.

The components of the preferred alternative (at DRMO Soils Operable Unit AOC 32, Alternative A6: Excavation and Off-site Disposal) include the following:

- Excavate the contaminated waste (1,300 cubic yards). Perform confirmatory sampling prior to backfilling.

- Transport the waste immediately to a final off-site disposal location (nonhazardous landfill).
- Backfill the area with clean material and revegetate.
- Monitor groundwater and review the site after 5 years.

The components of the preferred alternative at UST #13 Groundwater Operable Unit (AOC 32) (Alternative B3: Monitored Natural Attenuation) and at POL Storage Area/DRMO Yard (AOCs 32 and 43A) (Alternative C3: Monitored Natural Attenuation) include the following:

- Establish institutional controls to prevent intrusion into or installation of wells into the known area of contamination in the bedrock.
- Allow for monitored natural attenuation by naturally occurring microorganisms in the groundwater within the bedrock.
- Install additional groundwater monitoring wells.
- Collect and incorporate additional field data into groundwater flow and contaminant transport models.
- Monitor groundwater over the longterm and annually reports on groundwater quality.
- Review field data, modeling predictions, and compliance with ARARs at 5-year intervals.
- Review of the need for continued monitoring and additional action at 5-year intervals.

No changes or additions have been made to any alternative since the publication of the proposed plan.

XIII. STATE ROLE

The Commonwealth of Massachusetts has reviewed the alternatives presented in the FS and proposed plan and concurs with the selected remedy for the cleanup of the soil and groundwater contamination at AOCs 32 and 43A. The Commonwealth has also reviewed the RI/FS to determine if the selected remedy complies with applicable or relevant and appropriate laws and regulations of the Commonwealth. A copy of the declaration of concurrence is attached as appendix B.

APPENDIX A — ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX
AOCs 32 & 43A

1.0 PRE-REMEDIAL

1.0 Pre-Remedial

Reports

1. Final Basewide Environmental Basewide Survey (EBS) for Proposed Lease and/or Transfer,
   Fort Devens - Basewide, Arthur D. Little, Inc., (December, 1995). Filed in Group 1A.

Comments

1. Comments dated February 2, 1996 from D. Lynne Welsh, MADEP on the December, 1995 "Final Basewide Environmental Basewide Survey (EBS) for Proposed Lease and/or Transfer, Fort Devens - Basewide," Arthur D. Little, Inc. Filed in Group 1A.

1.2 Preliminary Assessment

Reports

1. Final Master Environmental Plan for Fort Devens, Argonne National Laboratory, (April, 1992). Filed in Group 1A.
2. Preliminary Zone II Analysis for the Production Wells at Fort Devens, MA, Draft Report, Engineering Technologies Associates, Inc., (January, 1994). Filed in Group 1A.

Comments

1. Comments dated May, 1992 from Walter Rolf, Montachusett Regional Planning Commission on the April, 1992 "Final Master Environmental Plan for Fort Devens," Argonne National Laboratory. Filed in Group 1A.
2. Comments dated May 7, 1992 from James P. Byrne, USEPA Region I on the April, 1992 "Final Master Environmental Plan for Fort Devens," Argonne National Laboratory. Filed in Group 1A.
3. Comments dated May 23, 1994 from D. Lynne Welsh, MADEP on the January, 1994 "Preliminary Zone II Analysis for the Production Wells at Fort Devens, MA, Draft Report," Engineering Technologies Associates, Inc. Filed in Group 1A.

Responses to Comments

1. Responses dated June 29, 1992 from Carrol J. Howard, Fort Devens to the comments on the April, 1992 "Final Master Environmental Plan for Fort Devens," Argonne National Laboratory. Filed in Group 1A.

1.3 Site Inspection

Work Plans

1. Final Quality Assurance Project Plan, Ecology and Environment, Inc., (November, 1991). Filed in Group 1B.
2. Final Health and Safety Plan, Ecology and Environment, Inc., (November, 1991). Filed in Group 1A.
3. Final Work Plan and Field Sampling Plan, Ecology and Environment, Inc., (February, 1992). Filed in Group 1B.
4. Final Task Order (Site Investigations) Work Plan - Historic Gas Stations, ABB Environmental Services, Inc., (December, 1992). Filed in Group 2&7.

Reports

1. Final Site Investigations Report, Ecology and Environment, Inc., (December, 1992). Filed in Group 1B.
2. Final SI Report, Groups 2 & 7 and Historic Gas Stations, Volume I - IV, ABB Environmental Services, Inc., (May, 1993). Filed in Group 2&7.
3. Revised Final Site Investigation Report, Groups 2 & 7 and Historic Gas Stations, Volumes I, II, III and IV, ABB Environmental Services, Inc., (October, 1995). Filed in Group 2&7.

Comments

1. Comments dated March 19, 1992 from James P. Byrne, USEPA Region I on the February, 1992 "Final Work Plan and Field Sampling Plan," Ecology and Environment, Inc. Filed in Group 1B.
2. Comments dated March 19, 1992 from James P. Byrne, USEPA Region I on the November, 1991 "Final Quality Assurance Project Plan," Ecology and Environment, Inc. Filed in Group 1B.
3. Comments dated March 19, 1992 from James P. Byrne, USEPA Region I on the November, 1991 "Final Health and Safety Plan," Ecology and Environment, Inc. Filed in Group 1B.
4. Comments dated January 12, 1993 from James P. Byrne, USEPA Region I on the December, 1992 "Final Site Investigations Report," Ecology and Environment, Inc. Filed in Group 1B.
5. Comments dated January 12, 1993 from James P. Byrne, USEPA Region I on the December, 1992 "Final Task Order (Site Investigations) Work Plan - Historic Gas Stations," ABB Environmental Services, Inc. Filed in Group 2&7.
6. Comments dated January 25, 1993 from D. Lynne Chappell, MADEP on the December, 1992 "Final Site Investigations Report," Ecology and Environment, Inc. Filed in Group 1B.
7. Comments dated July 9, 1993 from D. Lynne Chappell, MADEP on the May, 1993 "Final SI Report, Groups 2 & 7 and Historic Gas Stations, Volume I - IV," ABB Environmental Services, Inc. Filed in Group 2&7.

8. Comments dated July 15, 1993 from James P. Byrne, USEPA Region I on the May, 1993 "Final SI Report, Groups 2 & 7 and Historic Gas Stations, Volume I - IV," ABB Environmental Services, Inc. Filed in Group 2&7.

Responses to Comments

1. Responses dated September, 1993 from U.S. Army Environmental Center to the comments on the May, 1993 "Final SI Report, Groups 2 & 7 and Historic Gas Stations, Volume I - IV," ABB Environmental Services, Inc. Filed in Group 2&7.

Meeting Notes

1. SI Data Package Meeting Notes for Groups 2 & 7 and Historic Gas Stations, ABB Environmental Services, Inc., (April, 1993). Filed in Group 2&7.

2.0 REMOVAL RESPONSE

2.2 Removal Response Reports

Reports

1. Resource Conservation and Recovery Act Closure Report for Explosive Ordnance Demolition Open Burn/Open Detonation Area, Ecology and Environment, Inc., (September, 1994). Filed in Group 1B.

Comments

1. Comments dated October 20, 1994 from D. Lynne Welsh, MADEP on the September, 1994 "Resource Conservation and Recovery Act Closure Report for Explosive Ordnance Demolition "Open Burn/Open Detonation Area," Ecology and Environment, Inc. Filed in Group 1B.

2.9 Action Memoranda

Reports

1. Final Action Memorandum for the Removal Action at Study Area 32 (Signed October 26, 1992), (October, 1992). Filed in Group 1B.

3.0 REMEDIAL INVESTIGATION (RI)

3.2 Sampling and Analysis Data

Reports

1. Data Comparison Report, Group 2 & 7 Sites Through Round 1 Sampling, CDM Federal Programs Corporation, (March, 1993). Filed in Group 2&7.

3.4 Interim Deliverables

Work Plans

1. Final Projects Operations Plan - Volume I - III, ABB Environmental Services, Inc., (December, 1992). Filed in Group 1A.

Reports

1. Final Ground Water Flow Model at Fort Devens, Engineering Technologies Associates, Inc., (May 24, 1993). Filed in Group 1A.
2. Final Radiological Survey and Remediation Report DRMO Yard, ABB Environmental Services, Inc., (November, 1996). Filed in Group 1B.

Comments

1. Comments dated January 12, 1993 from James P. Byrne, USEPA Region I on the December, 1992 "Final Projects Operations Plan - Volume I - III," ABB Environmental Services, Inc. Filed in Group .
2. Comments Dated February 1, 1993 from James P. Byrne, EPA Region I and D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the October 30, 1992 "Draft Final Ground Water Flow Model at Fort Devens,". Filed in Group 1A.
3. Comments dated February 17, 1993 from D. Lynne Chappell, MADEP on the December, 1992 "Final Projects Operations Plan - Volume I - III," ABB Environmental Services, Inc. Filed in Group.
4. Comments dated September 3, 1996 from James P. Byrne, USEPA Region I on the July, 1996 "Draft Radiological Survey and Remediation Report DRMO Yard," ABB Environmental Services, Inc. Filed in Group 1B.
5. Comments dated September 16, 1996 from John Regan, MADEP on the July, 1996 "Draft Radiological Survey and Remediation Report DRMO Yard," ABB Environmental Services, Inc. Filed in Group 1B.

Comments on Responses to Comments

1. Comments dated December 3, 1996 from James P. Byrne, USEPA Region I on the responses on the November, 1996 "Final Radiological Survey and Remediation Report DRMO Yard," ABB Environmental Services, Inc. Filed in Group 1B.

3.5 Applicable or Relevant and Appropriate Requirements (ARARs)

Reports

1. Draft Applicable or Relevant and Appropriate Requirements (ARARs) for CERCLA Remedial Actions, U.S. Army Toxic and Hazardous Materials Agency, (June, 1992). Filed in Group 1B.
2. Draft Assessment of Location-Specific Applicable or Relevant and Appropriate Requirements (ARARs) for Fort Devens, Massachusetts, U.S. Army Toxic and Hazardous Materials Agency, (September, 1992). Filed in Group 1B.

3.6 Remedial Investigation (RI) Reports

Reports

1. Final Remedial Investigations Report, Functional Area II, Volume I - IV, Ecology and Environment, Inc., (August, 1994). Filed in Group 1B.

Comments

1. Comments dated October 14, 1994 from D. Lynne Welsh, MADEP on the August, 1994 "Final Remedial Investigations Report, Functional Area II, Volume I - IV," Ecology and Environment, Inc. Filed in Group 1B.

Responses to Comments

1. Responses dated December 21, 1994 from U.S. Army Environmental Center to the comments on the December 21, 1994 "Responses on the following document: "Draft Remedial Investigation Addendum Report," ABB Environmental Services, Inc.," U.S. Army Environmental Center. Filed in Group 1A.
2. Responses dated March 17, 1995 from U.S. Army Environmental Center to the comments on the August, 1994 "Final Remedial Investigations Report, Functional Area II, Volume I - IV," Ecology and Environment, Inc. Filed in Group 1B.

3.7 Work Plans and Progress Reports

Work Plans

1. Final Oversight and Screening Activities, DRMO Yard Addendum to Work Plan Supplement Remedial Investigations - Group 1B Sites, Fort Devens, Massachusetts, Ecology and Environment, Inc., (February, 1993). Filed in Group 1B.
2. Final Work Plan Supplement - Remedial Investigations, Group 1B Sites, Ecology and Environment, Inc., (February, 1993). Filed in Group 1B.
3. Draft Quality Assurance Project Plan, Remedial Investigations, Groups 2 & 7 and South Post Impact Area, Fort Devens, Massachusetts, Ecology and Environment, Inc., (June, 1993). Filed in Group 1B.

4. Technical Plans Supplement B Remedial Investigations/Feasibility Studies Group 1B Sites and Functional Areas I and II, Fort Devens, Massachusetts, Ecology and Environment, Inc., (September, 1993). Filed in Group 1B.
5. Final Radiological Survey Work Plan, Defense Reutilization and Marketing Office (DRMO) Yard, Fort Devens, Massachusetts, ABB Environmental Services, Inc., (August 4, 1995). Filed in Group 1B.
6. Radiological Survey Work Plan Addendum Defense Reutilization and Marketing Office (DRMO) Yard, ABB Environmental Services, Inc., (February 14, 1996). Filed in Group 1B.

Comments

1. Comments dated March 3, 1992 from Carrol J. Howard, Fort Devens on the February, 1992 "Final Work Plan and Field Sampling Plan," Ecology and Environment, Inc. Filed in Group 1A.
2. Comments on the "Draft Remedial Investigation Work Plan for Group 1B," Ecology and Environment, Inc. Filed in Group 1B.
3. Comments dated September 30, 1992 from James P. Byrne, USEPA Region I on the August, 1992 "Draft Work Plan Supplement - Remedial Investigations," Ecology and Environment, Inc. Filed in Group 1B.
4. Comments dated October 13, 1992 from D. Lynne Chappell, MADEP on the August, 1992 "Draft Work Plan Supplement - Remedial Investigations," Ecology and Environment, Inc. Filed in Group 1B.
5. Comments dated January 11, 1993 from James P. Byrne, USEPA Region I on the November, 1992 "Draft Final Work Plan Supplement - Remedial Investigations, Group 1B Sites," Ecology and Environment, Inc. Filed in Group 1B.
6. Comments dated January 15, 1993 from D. Lynne Chappell, MADEP on the November, 1992 "Draft Final Work Plan Supplement - Remedial Investigations, Group 1B Sites," Ecology and Environment, Inc. Filed in Group 1B.
7. Comments dated March 23, 1993 from D. Lynne Chappell, MADEP on the February, 1993 "Final Oversight and Screening Activities, DRMO Yard Addendum to Work Plan Supplement Remedial Investigations - Group 1B Sites, Fort Devens, Massachusetts," Ecology and Environment, Inc. Filed in Group 1B.
8. Comments dated June 21, 1993 from James P. Byrne, USEPA Region I on the September, 1993 "Technical Plans Supplement B Remedial Investigations/Feasibility Studies Group 1B Sites and Functional Areas I and II, Fort Devens, Massachusetts," Ecology and Environment, Inc. Filed in Group 1B.
9. Comments dated November 3, 1993 from D. Lynne Welsh, MADEP on the September, 1993 "Technical Plans Supplement B Remedial Investigations/Feasibility Studies Group 1B Sites and Functional Areas I and II, Fort Devens, Massachusetts," Ecology and Environment, Inc. Filed

in Group 1B.

10. Comments dated July 25, 1995 from D. Lynne Welsh, MADEP on the July 10, 1995 "Draft Radiological Survey Work Plan, Defense Reutilization and Marketing Office (DRMO) Yard, Fort Devens, Massachusetts," ABB Environmental Services, Inc. Filed in Group 1B.
11. Comments dated August 11, 1995 from James P. Byrne, USEPA Region I on the August 4, 1995 "Final Radiological Survey Work Plan, Defense Reutilization and Marketing Office (DRMO) Yard, Fort Devens, Massachusetts," ABB Environmental Services, Inc. Filed in Group 1B.
12. Comments dated August 18, 1995 from D. Lynne Welsh, MADEP on the August 4, 1995 "Final Radiological Survey Work Plan, Defense Reutilization and Marketing Office (DRMO) Yard, Fort Devens, Massachusetts," ABB Environmental Services, Inc. Filed in Group 1B.
13. Comments dated February 21, 1996 from James P. Byrne, USEPA Region I on the February 14, 1996 "Radiological Survey Work Plan Addendum Defense Reutilization and Marketing Office (DRMO) Yard," ABB Environmental Services, Inc. Filed in Group 1B.
14. Comments dated March 8, 1996 from John Regan, MADEP on the February 14, 1996 "Radiological Survey Work Plan Addendum Defense Reutilization and Marketing Office (DRMO) Yard," ABB Environmental Services, Inc. Filed in Group 1B.

Responses to Comments

1. Responses from U.S. Army Environmental Center to the comments on the September, 1993 "Technical Plans Supplement B Remedial Investigations/Feasibility Studies Group 1B Sites and Functional Areas I and II, Fort Devens, Massachusetts," Ecology and Environment, Inc. Filed in Group 1B.
2. Responses dated August 4, 1995 from U.S. Army Environmental Center to the comments on the July 10, 1995 "Draft Radiological Survey Work Plan, Defense Reutilization and Marketing Office (DRMO) Yard, Fort Devens, Massachusetts," ABB Environmental Services, Inc. Filed in Group 1B.

Comments on Responses to Comments

1. Comments dated November 8, 1993 from James P. Byrne, USEPA Region I on the responses on the September, 1993 "Technical Plans Supplement B Remedial Investigations/Feasibility Studies Group 1B Sites and Functional Areas I and II, Fort Devens, Massachusetts," Ecology and Environment, Inc. Filed in Group 1B.

3.9 Heath Assessments

Work Plans

1. Risk Assessment Approach Plan (RAAP) Remedial Investigations - Group 1B Sites, Ecology and Environment, Inc., (May, 1994). Filed in Group 1B.

4.0 FEASIBILITY STUDY (FS)

4.4 Interim Deliverables

Work Plans

1. Draft Initial Screening of Alternatives for Functional Areas I and II, Ecology and Environment, Inc., (June, 1994). Filed in Group 1B.

Reports

1. Detailed Analysis of Alternatives for Functional Areas I and II, Ecology and Environment, Inc., (September, 1994). Filed in Group 1B.

Comments

1. Comments dated July 18, 1994 from D. Lynne Welsh, MADEP on the June, 1994 "Draft Initial Screening of Alternatives for Functional Areas I and II," Ecology and Environment, Inc. Filed in Group 1B.
2. Comments dated October 13, 1994 from D. Lynne Welsh, MADEP on the September, 1994 "Detailed Analysis of Alternatives for Functional Areas I and II," Ecology and Environment, Inc. Filed in Group 1B.

Responses to Comments

1. Responses dated August, 1994 from U.S. Army Environmental Center to the comments on the June, 1994 "Draft Initial Screening of Alternatives for Functional Areas I and II," Ecology and Environment, Inc. Filed in Group 1B.

4.6 Feasibility Study (FS) Reports

Reports

1. Final Feasibility Study for Functional Area II, Ecology and Environment, Inc., (September, 1996). Filed in Group 1B.
2. Revised Final Feasibility Study for Functional Area II, Ecology and Environment, Inc., (January 1997). Filed in Group 1B.

Comments

1. Comments dated May 8, 1995 from D. Lynne Welsh, MADEP on the March, 1995 "Draft Feasibility Study for Functional Area II, Fort Devens, Massachusetts," Ecology and Environment, Inc. Filed in Group 1B.
2. Comments dated November 8, 1996 from James P. Byrne, USEPA Region I on the September, 1996 "Final Feasibility Study for Functional Area II," Ecology and Environment, Inc. Filed in Group 1B.
3. Comments dated May 9, 1997 from James P. Byrne, USEPA Region I on the January 1997 "Revised Final Feasibility Study for Functional Area II," Ecology and Environment, Inc. Filed in Group 1B.

4.9 Proposed Plans for Selected Remedial Action

Reports

1. Proposed Plan for the Defense Reutilization Marketing Office (DRMO) Yard (AOC 32) and Petroleum, Oils, and Lubrication Storage Area (POL) (AOCs 43A), Horne Engineering Services, Inc., (June, 1997). Filed in Group 1B.

Comments

1. Comments dated March 3, 1997 from John Regan, MADEP on the January 31, 1997 "Proposed Plan for the Defense Reutilization Marketing Office (DRMO) Yard (AOC 32) and Petroleum, Oils, and Lubrication Storage Area (POL) (AOCs 43A)," Horne Engineering Services, Inc. Filed in Group 1B.
2. Comments dated May 9, 1997 from James P. Byrne, USEPA Region I on the January 31, 1997 "Proposed Plan for the Defense Reutilization Marketing Office (DRMO) Yard (AOC 32) and Petroleum, Oils, and Lubrication Storage Area (POL) (AOCs 43A)," Horne Engineering Services, Inc. Filed in Group 1B.

5.0 RECORD OF DECISION (ROD)

5.4 Record of Decision (ROD)

Reports

1. Draft Record of Decision for the Defense Reutilization Marketing Office (DRMO) Yard (AOC 32) and Petroleum, Oils, and Lubrication Storage Area (POL) (AOCs 43A), Horne Engineering Services, Inc., (February, 1997). Filed in Group 1B.

Comments

1. Comments dated April 17, 1997 from John Regan, MADEP on the February, 1997 "Draft Record of Decision for the Defense Reutilization Marketing Office (DRMO) Yard (AOC 32) and Petroleum, Oils, and Lubrication Storage Area (POL) (AOCs 43A)," Horne Engineering Services, Inc. Filed in Group 1B.

10.0 ENFORCEMENT

10.16 Federal Facility Agreements

1. Final Federal Facility Agreement Under CERCLA Section 120, EPA Region I and U.S. Department of the Army with attached map, , (November 15, 1991). Filed in Group 1A.

13.0 COMMUNITY RELATIONS

13.2 Community Relations Plans

1. Final Community Relations Plan, Ecology and Environment, Inc., (February, 1992). Filed in Group 1A.

Reports

1. Fort Devens Community Relations Plan for Environmental Restoration, 1995 Update, ABB Environmental Services, Inc., (May, 1995). Filed in Group 1A.

Comments

1. Comments dated March 19, 1992 from James P. Byrne, USEPA Region I on the February, 1992 "Final Community Relations Plan," Ecology and Environment, Inc. Filed in Group 1B.

APPENDIX B — DECLARATION OF STATE CONCURRENCE

Mary Sanderson

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CENTRAL REGIONAL OFFICE

ARGEO PAUL CELLUCCI
Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

December 29, 1997

Mr. Harley F. Laing, Director
U.S. Environmental Protection Agency
New England
JFK Federal Building
Boston, MA 02203

RE: Record of Decision for Area for Contamination (AOC) 32 and AOC 43A Devens, Massachusetts.

Dear Mr. Laing:

The Massachusetts Department of Environmental Protection (MADEP) has reviewed the Record of Decision (ROD) proposed by the United States Army and the U.S. Environmental Protection Agency (EPA), for the Area of Contamination AOC 32 and AOC 43A and the selected remedy.

The ROD identifies three separate Operable Units. The Operable Units and the selected remedies are:

1. Defense Reutilization and Marketing Office (DRMO) Yard Soils Operable Unit AOC 32; The excavation and removal of 1,300 cubic yards of Polychlorinated Biphenyls impacted soil is planned for the DRMO yard as the selected remedial alternative.

2. Underground Storage Tank (UST) #13 Groundwater Operable Unit AOC 32; The chosen remedial alternative for UST #13, Groundwater Operable Unit AOC 32, is intrinsic remediation and groundwater monitoring for 30 years to evaluate natural attenuation and bioremediation progress. Along with above noted remedy the UST and 227 cubic yard of waste oil contaminated soil was removed in May, 1992.

627 Main Street • Worcester, Massachusetts 01608 • Telephone (508) 792-7692

Fax (508)792-7621

TTD #(508)767-2788

3. Petroleum, Oils and Lubricants Storage Area Defense Reutilization and Marketing Office Yard Groundwater Operable Unit AOC 32 and AOC 43A; The selected remedial alternative is intrinsic remediation and groundwater monitoring for 30 years to evaluate natural attenuation and bioremediation progress.

The MADEP concurs with the ROD for AOC 32, UST #13 and AOC 43A and would like to thank the US Army, particularly Jim Chambers BRAC Environmental Coordinator, and Jim Byrne, EPA, the Fort Devens Remedial Project Manager, for their efforts to ensure that the requirements of the MADEP were met. We look forward to continuing to work with the EPA at other sites at Devens.

If you have any questions, please contact David M. Salvadore at (508) 792-7653, ext. 3842.

Sincerely,

for E. A. S. Adams

E. Gail Suchman
Regional Director

p:\DSAL\AOC32\43A.ROD

CC: Edward Kunce, MADEP
Jay Naparstek, MADEP
Informational Repositories
Fort Devens Mailing List
Ron Ostrowski, DCC
Jim Byrne, EPA
Jeff Waugh, AEC
Patricia Momm, ABB
Mark Applebee, ACOE

APPENDIX C — FIGURES

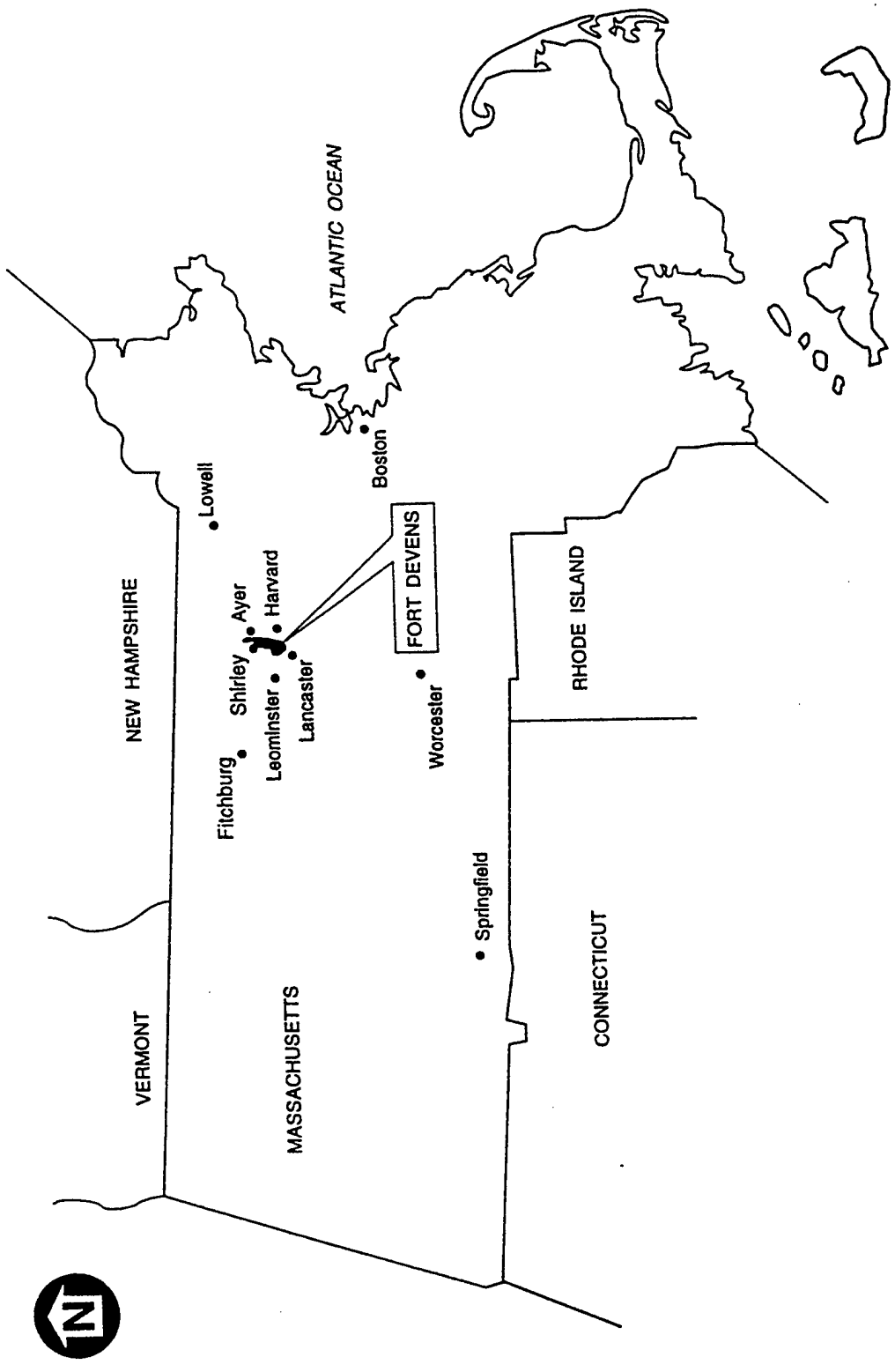


Figure 1 - Location of Devens in Massachusetts

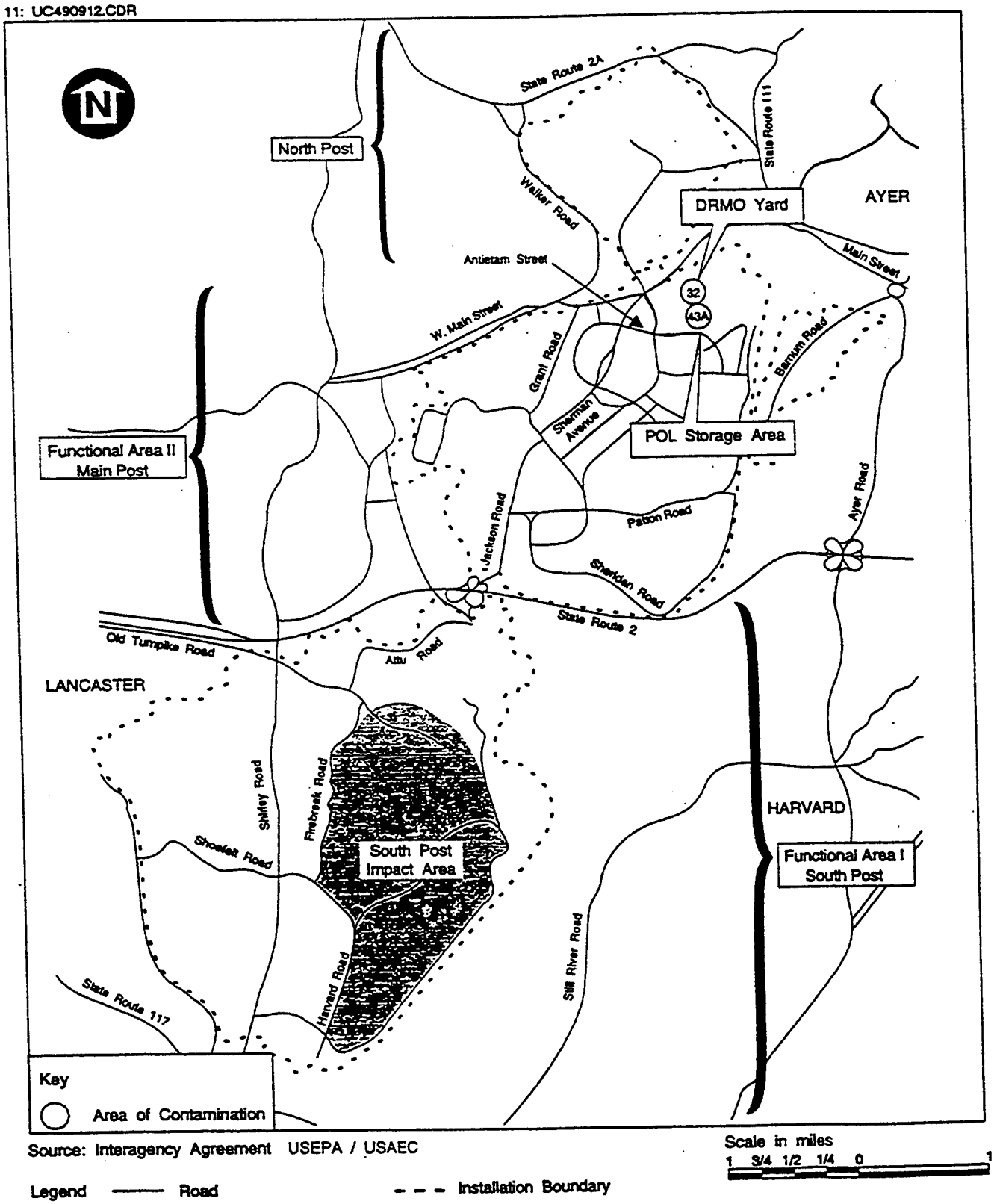


Figure 2 - Location of Functional Area II Sites

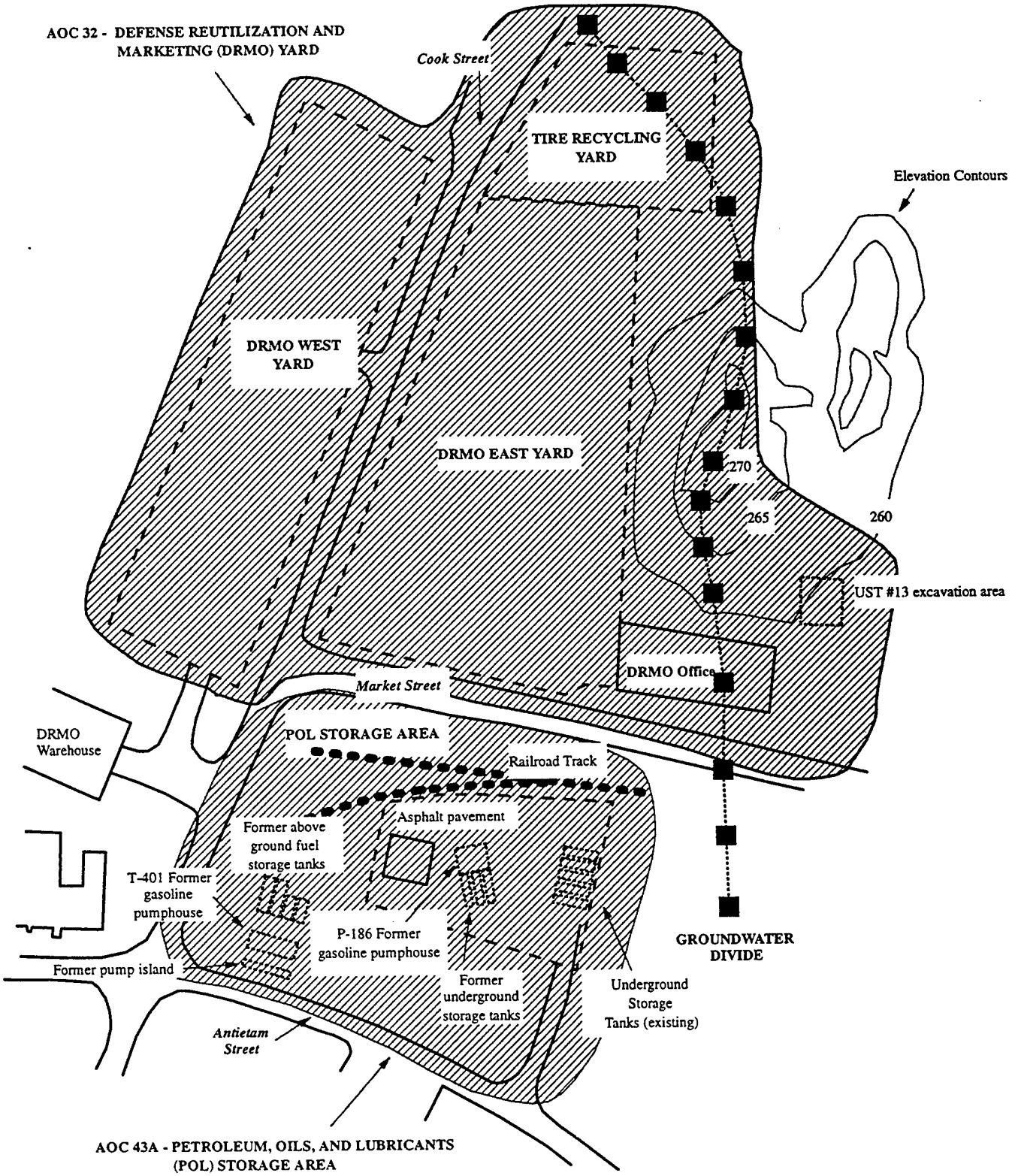
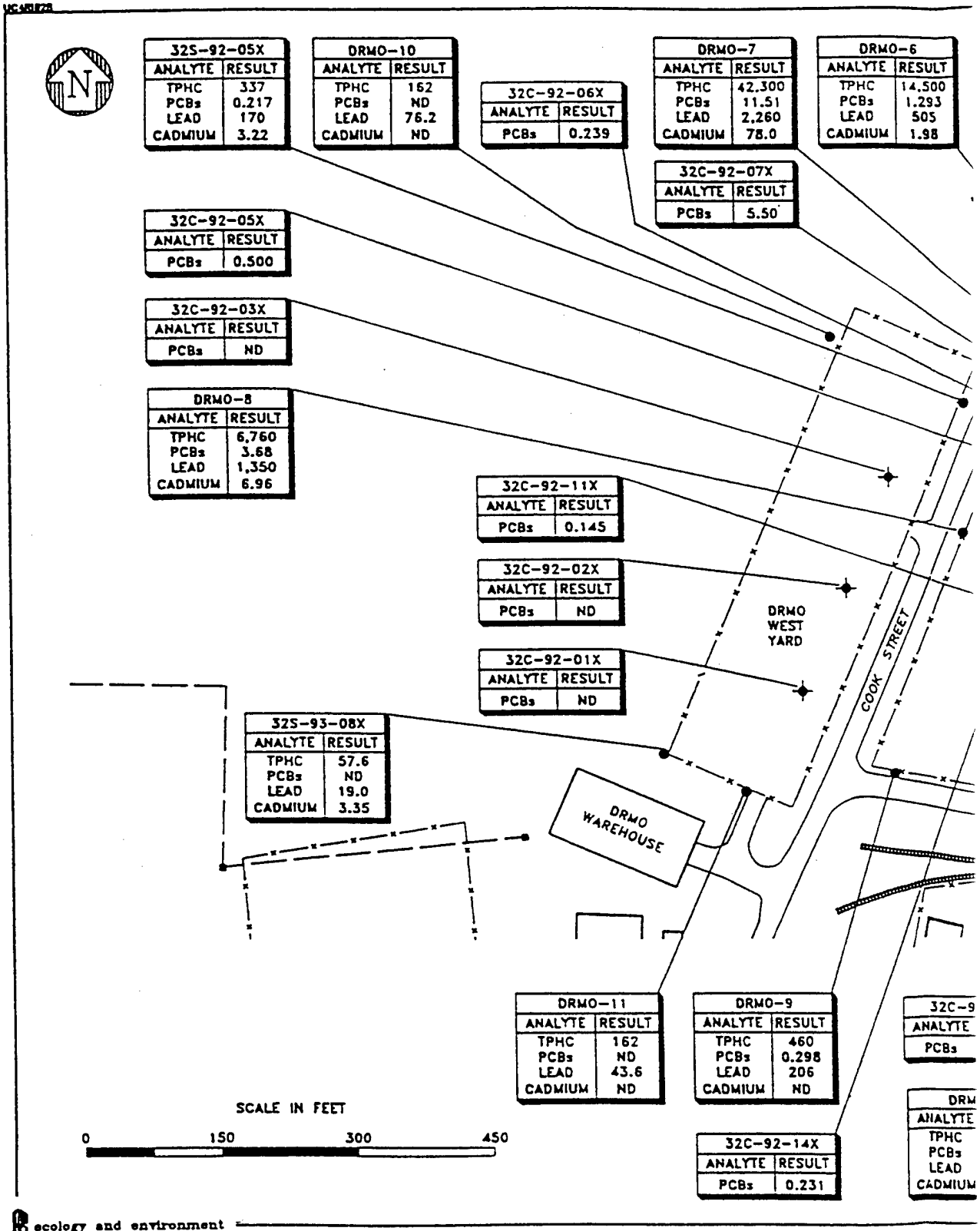


Figure 3 - Approximate Boundaries of AOC 32 and 43A



ecology and environment

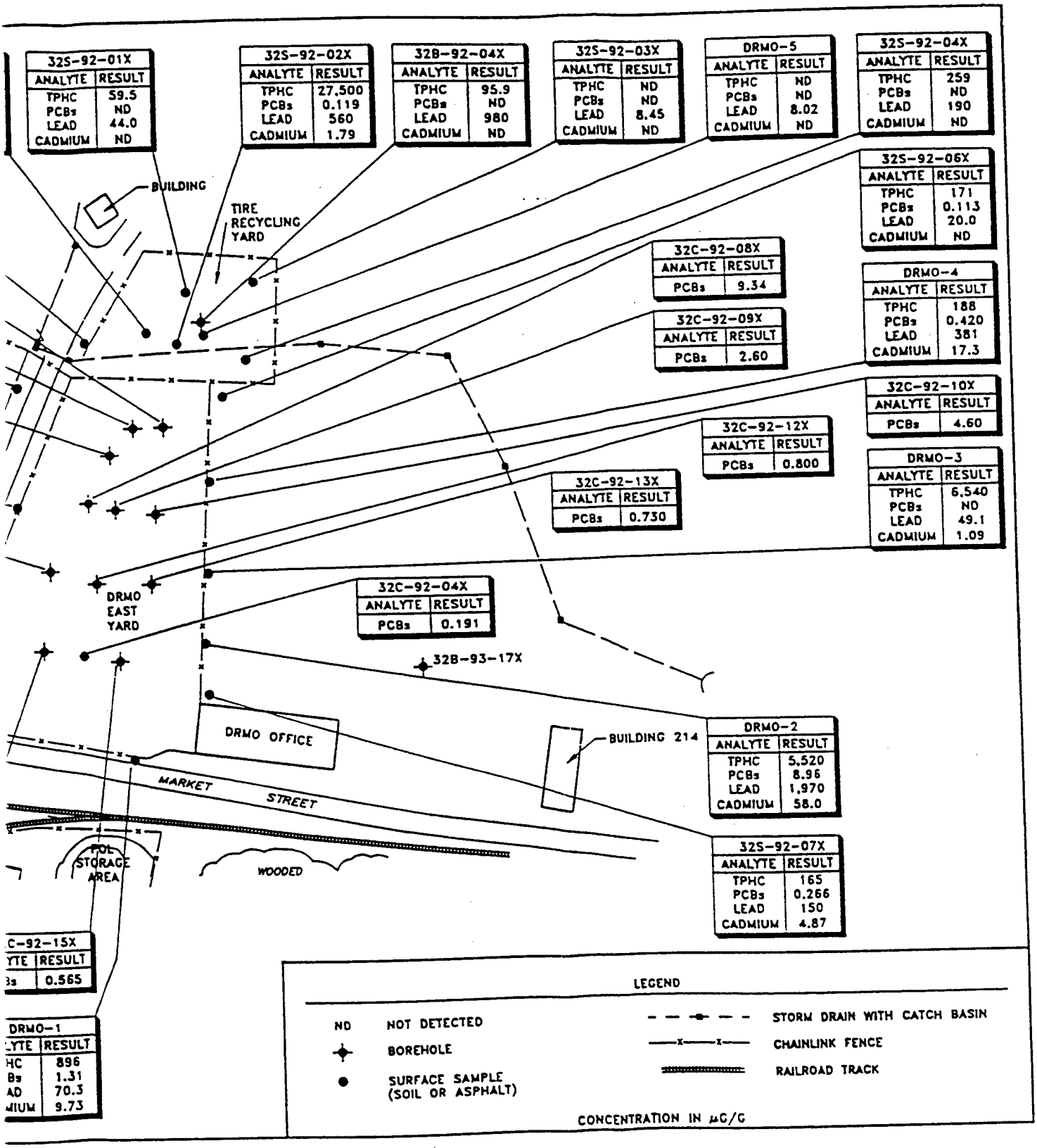


Figure 4 - Contamination in Surface Soil and Asphalt at AOC 32

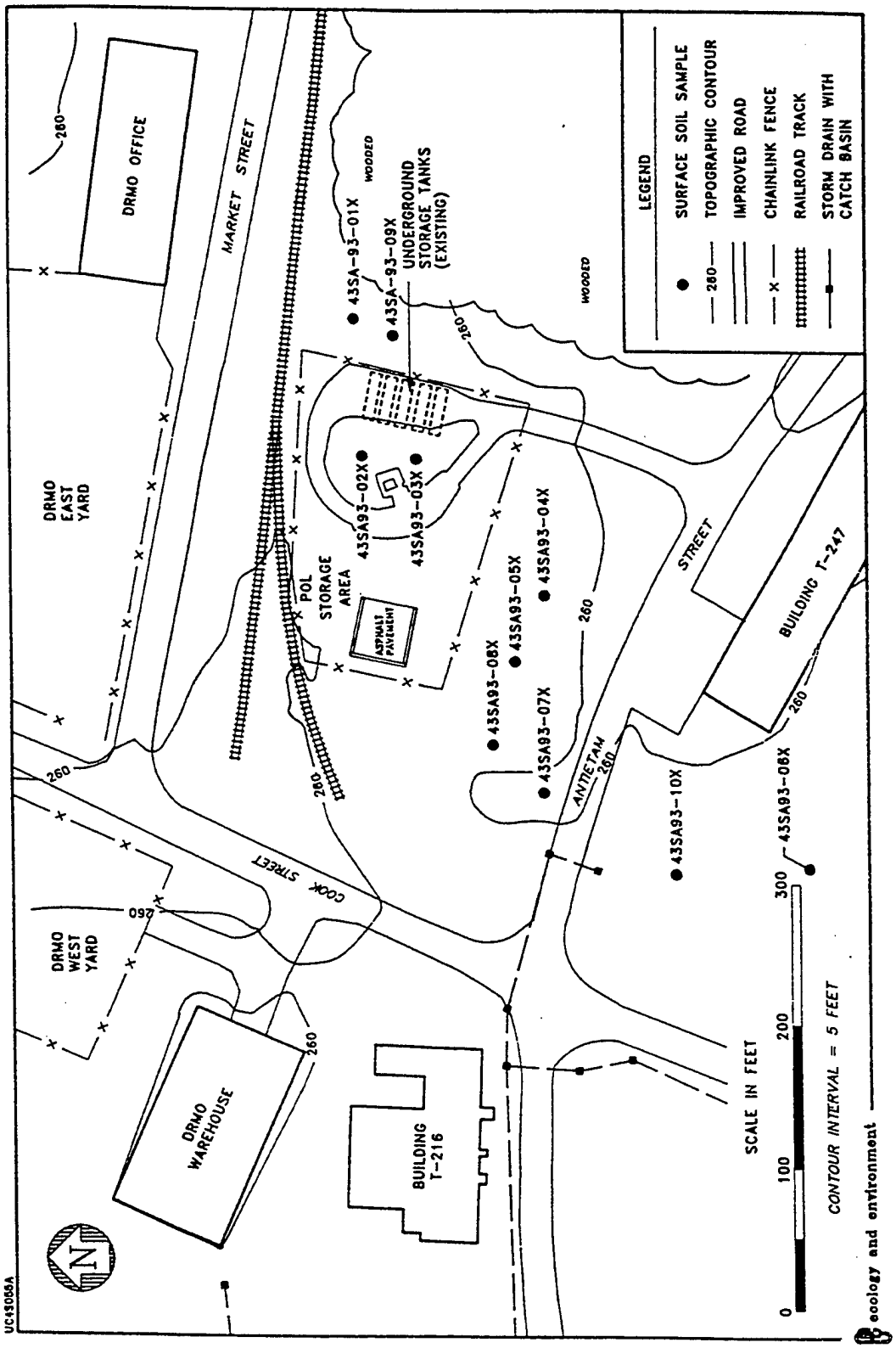
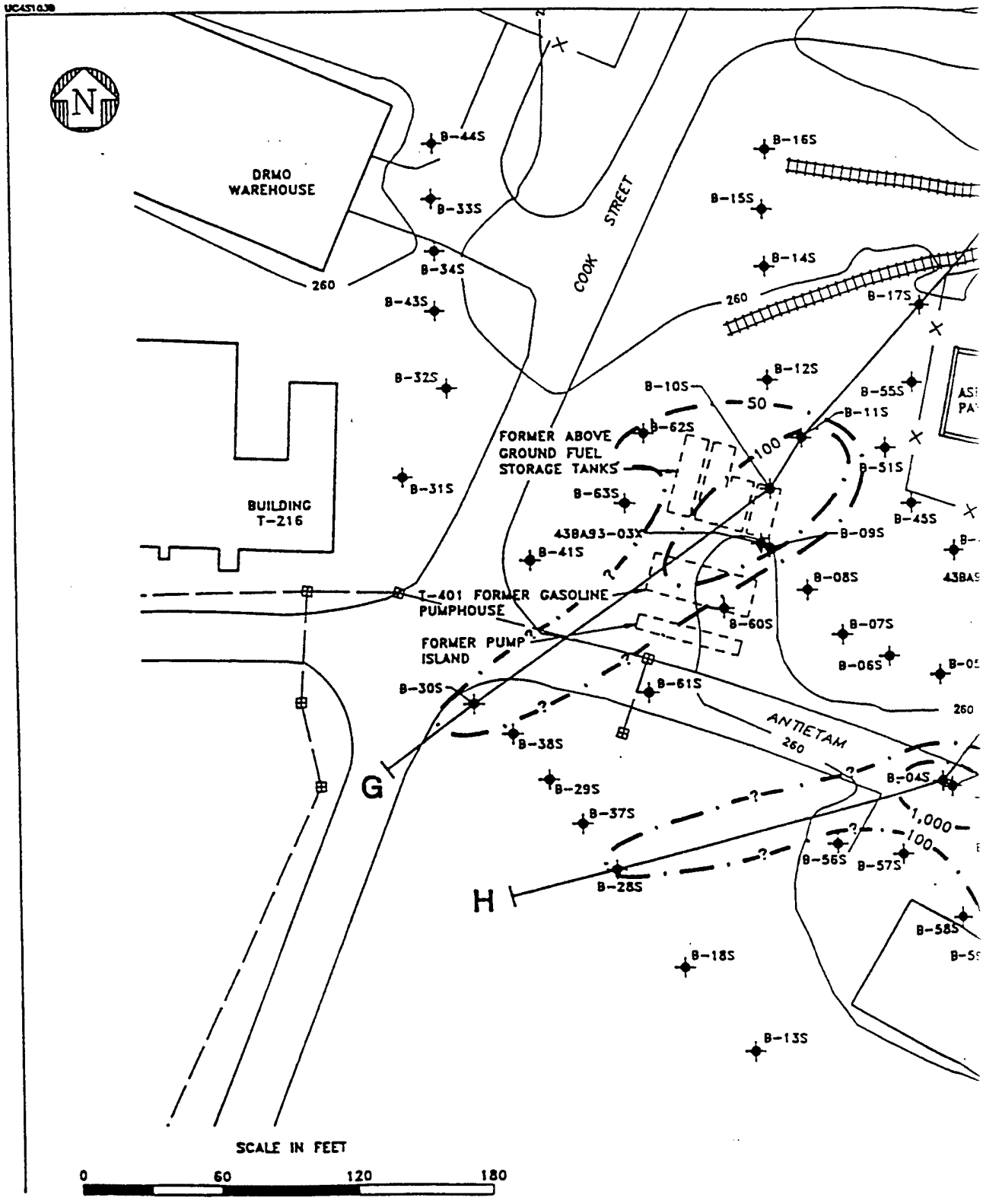


Figure 5 - Location of Soil Sampled at AOC 43A



ecology and environment

(1)

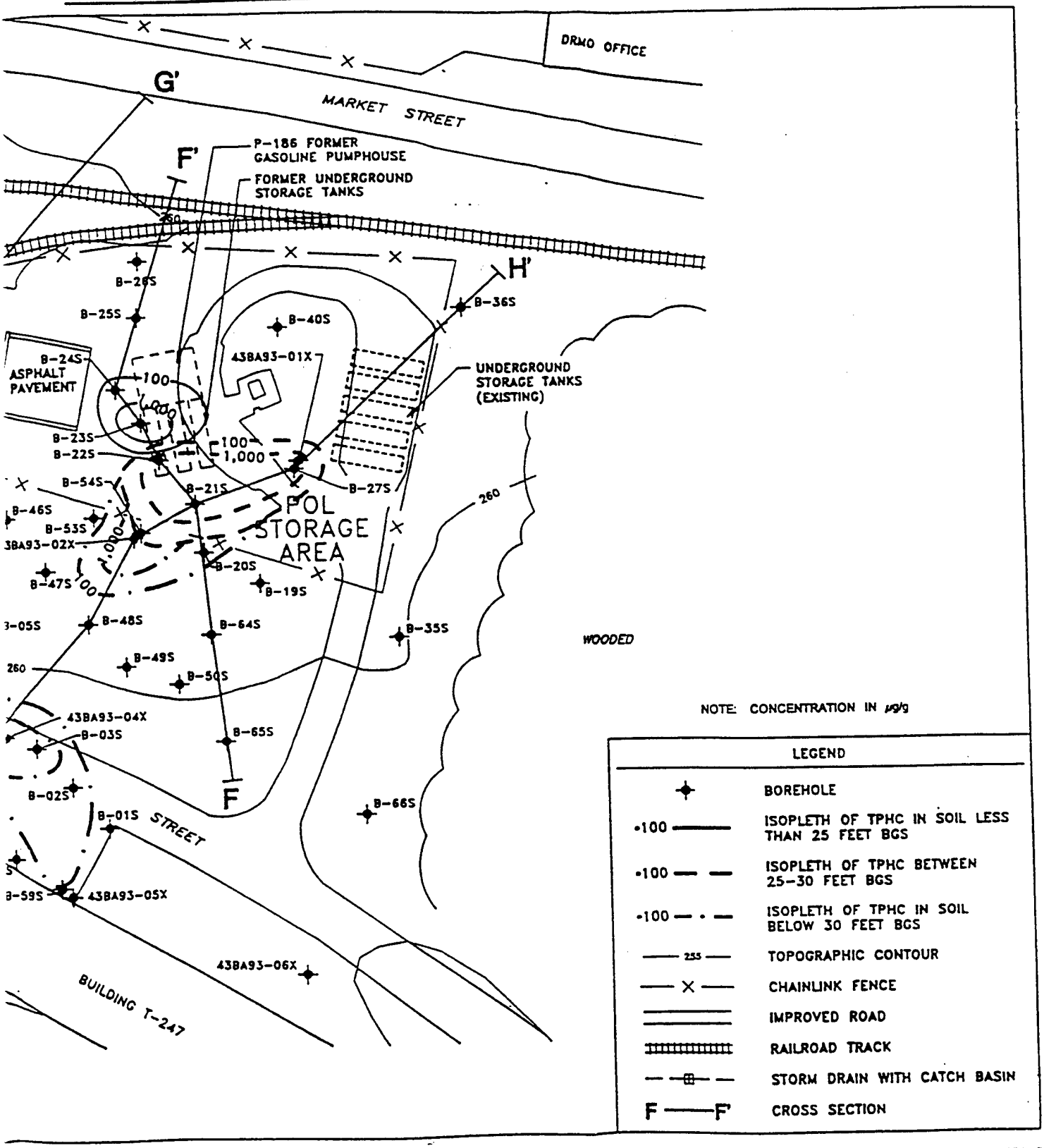


Figure 6 - Distribution of TPHC Concentrations in Soil by Depth in Boreholes as Derived from Field Screening at AOC 43A

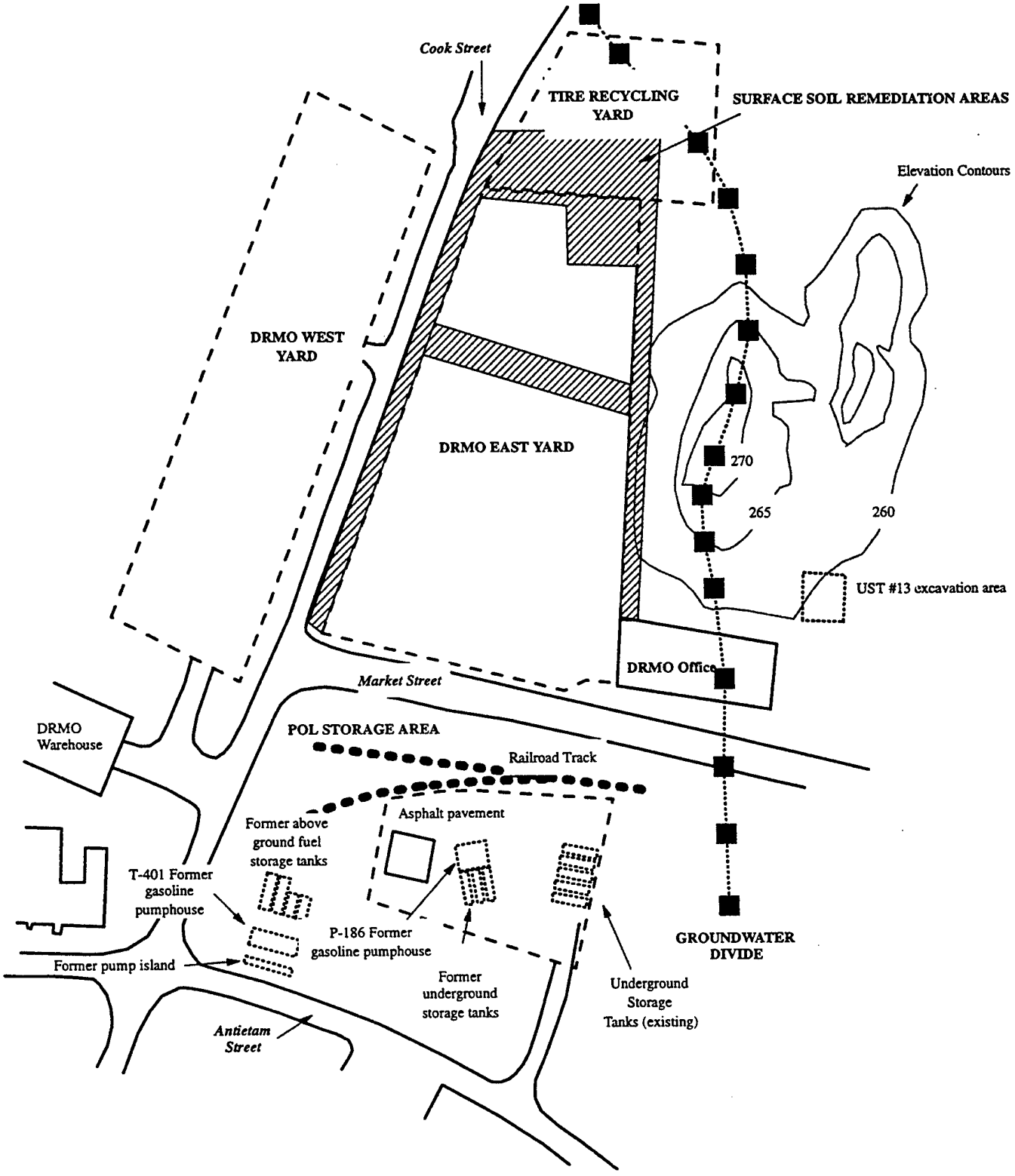


Figure 7 - DRMO Yard Soils Operable Unit

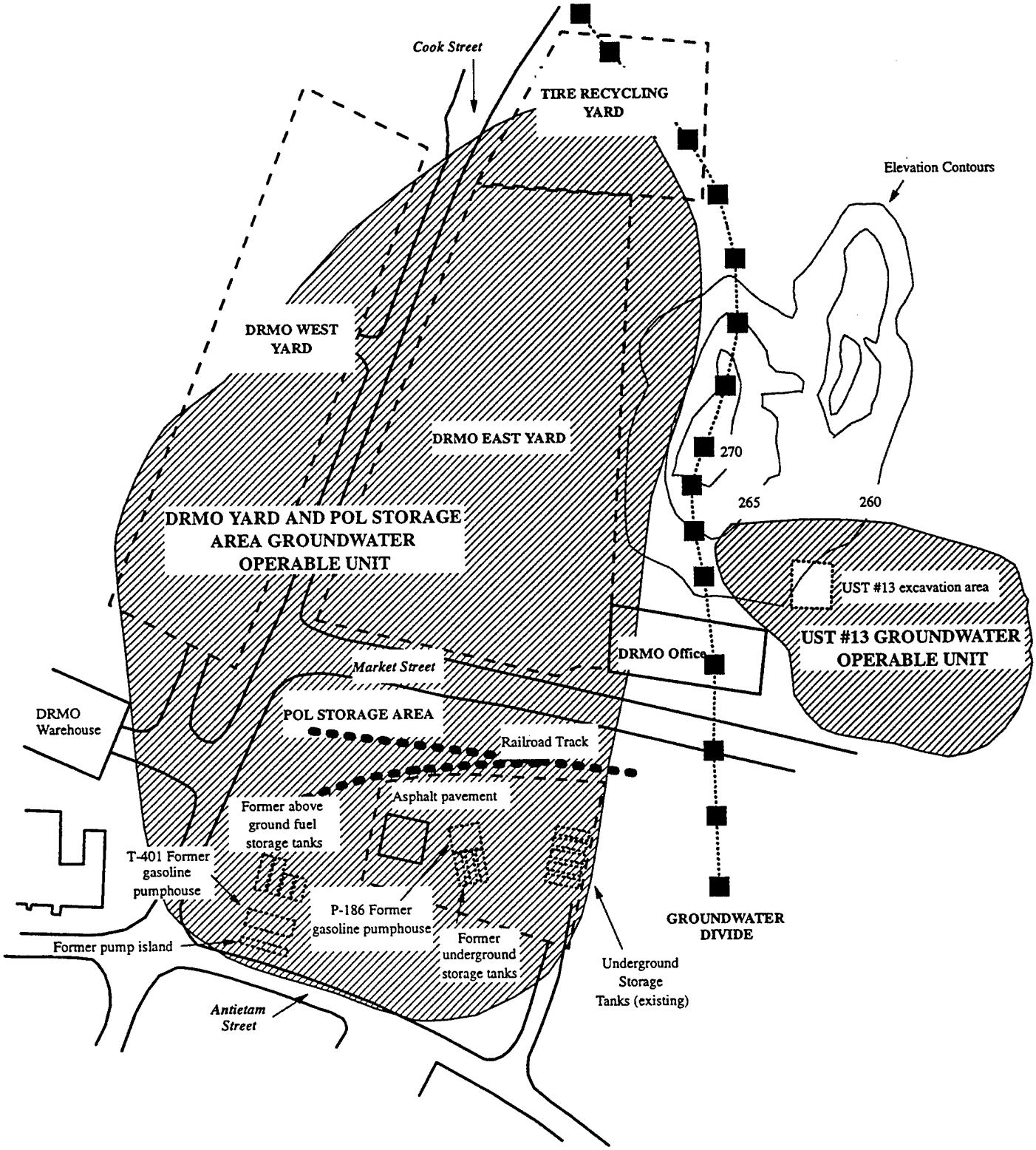


Figure 8 - DRMO Yard and POL Storage Area Groundwater Operable Units

APPENDIX D — RESPONSIVENESS SUMMARY

Volume I
Pages 1 to 4

U.S. ARMY

BASE REALIGNMENT AND CLOSURE

DEVENS RESERVE FORCES TRAINING AREA

- -x

PUBLIC HEARING ON PROPOSED PLAN FOR AOC's 32 and 43A

- -x

BEFORE: James Chambers, BRAC Environmental Coordinator

Held at:

Devens Reserve Forces Training Area Headquarters
31 Quebec Street (Building 679)
Ayer, Massachusetts 01432
Thursday, July 17, 1997
7:29 p.m.

(Ken A. DiFraia, Certified Court Reporter)

* * * *

P R O C E E D I N G S

MR. CHAMBERS: Good evening. My name is James Chambers. I'm the BRAC environmental coordinator for the United States Army here at the Devens Reserved Forces training area.

Thank you for coming out this evening. We are holding a public hearing for the proposed plan for remediation for areas of contamination, 32 DRMO yard and 43A, the petroleum oil and lubrication storage facility.

This evening we are moving towards the end of the public comment period, the end of the 30 day public comment period which commenced on June 18th. The comment period ends tomorrow, July 18th. I invite you to either submit any comments you would like for the record, either written by close of business tomorrow or verbally this evening. I also would ask you that if you have a comment to make this evening, you announce your name for the court stenographer we have for recording the meeting this evening.

It's 7:30 right now. I'll hold the meeting open for five minutes. As there's only one member of the public here this evening, we'll see if

there's anybody else that would like to make a comment. Again, please announce your name and comment or submit a written comment. Thank you.

We will take a timeout for a moment.

(Pause)

MR. LINDE: For the record, my name is Richard Linde from the Town of Ayer Water Department. My concerns, which I believe were handled to my satisfaction and possibly the Town's satisfaction, were the groundwater flow from the dismantling of the yard. My concerns were answered to my satisfaction. I don't believe there will be a threat to the Town of Ayer.

I would like to thank the office for assisting me today with my concerns.

MR. CHAMBERS: You're welcome.

(Pause)

MR. CHAMBERS: There being no further comments, I hereby close the public hearing for AOC's 32 and 43A. Thank you all for coming.

(Whereupon the proceedings were adjourned at 7:35 p.m.)

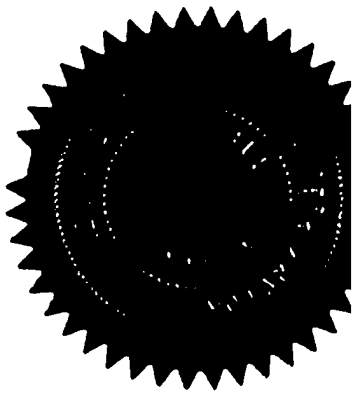
C E R T I F I C A T E

I, KEN A. DiFRAIA, Certified Shorthand Reporter, do hereby certify that the foregoing transcript, Volume I, is a true and accurate transcription of my stenographic notes taken on July 17, 1997.

Ken A. DiFraia 7/24/97

Ken A. DiFraia

Certified Shorthand Reporter



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RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
James Byrne EPA New England May 9, 1997	-	-	-	Please change the name of the "Intrinsic Remediation" alternative to "Monitored Natural Attenuation". Please use the following definition when describing monitored natural attenuation: "Monitored natural attenuation is the combination of physical, chemical, and biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in soil or groundwater in a reasonable time frame. These in-situ processes include biodegredation, dispersion, dilution, adsorption, volatilization, and biological and chemical stabilization or destruction of contaminants."	The term "Intrinsic Remediation" has been replaced in the ROD by "Monitored Natural Attenuation." The ROD offers the following explanation for the name change; "This ROD will use the more descriptive name "monitored natural attenuation" in place of "Intrinsic remediation." The terms are synonymous.
	-	-	-	ARARs Tables: a: Please see the ARARs tables in the October 1996 ROD for AOCs 43G & J for the correct ARARs for the groundwater alternative and title accordingly. Additionally, in the header at the top of the page please state what type of ARARs they are (i.e., action specific, etc.) The 43G & J Tables should be very similar, if not the same. b. Please note the SDWA is both an action- and chemical specific ARAR in this case. Additionally, in your "Action to be taken to attain requirement" section of the Table for both MCL and MMCLs, please state that they will be met by this alternative as well as being used to evaluate performance. c. Please add an ARARs table for Alternative A6 with an appropriate title, please see that handwritten attachment for details.	a & c. The ARAR tables from AOC 43G & 43J ROD will be added and modified as appropriate. b. Requested clarification will be incorporated.

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
	-	-	-	Alternative A6. Was on-site use of the soil as part of the landfill remediation project considered? Are we confident that the soils excavated will be non-hazardous? Please add a contingency for hazardous oil disposal.	Yes. On-site re-use of the excavated soils is currently being considered as part of the landfill remediation project. If, based on waste characterization, the excavated soils meet the requirements for "Reuse and Disposal of Contaminated Soils at Landfills" Department of Environmental Protection, Bureau of Waste Prevention, Interim Policy #BWP-94-037, then the soils would likely be re-used as daily cover material during the construction of the new landfill cell.
	-	-	-	Alternative B3. Please discuss approximately how long you expect natural attenuation to take as compared to more active remediation.	No estimated have been made regarding the length of time required to remediate the site via Monitored Natural Attenuation or more active alternatives. This information will be developed as part of the Monitored Natural Attenuation Assessment.
John Regan MADEP April 17, 1997	ii	Para 1	1st bullet	Note that all excavated soil will be disposed of off-post and that confirmatory sampling will be conducted prior to backfill	The following text has been added: "Perform confirmatory sampling prior to backfilling."
	ii	Para 1	4th bullet	Note groundwater will be monitored on an annual basis and site reviews will be conducted every five years for thirty years or until groundwater contamination is reduced to acceptable concentrations.	The section being commented upon is intended to be a summary of the major components of the selected remedy. Details on the selected remedy are provided in Section X of the ROD. No changes will be made to the existing text. The Army may request a reduction in the frequency of groundwater monitoring if warranted by site conditions. Annual monitoring will be required unless EPA and MADEP agree to a reduced frequency.
	ii	Para 3	5th bullet	Note that long term monitoring will be conducted on an annual basis.	See response to previous comment.

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
	ii	Para 3	7th bullet	Note groundwater will be monitored on an annual basis and site reviews will be conducted every five years for thirty years or until groundwater contamination is reduced to acceptable concentrations.	The text was modified.
	7	Para 1	V.b.1.a	The description of DRMO Yard soils should state that site soils also contained PCBs in excess of state standards	The following text was added: "PCBs were detected in site soils at concentrations in excess of state standards."
	21	Para 5	VII	The detailed analysis of remedial alternatives presented in the Functional Area II Feasibility Study specifies that long term monitoring will be conducted in conjunction with IR. This should be reflected in the ROD. Please add "with long term monitoring" to the bullet describing IR.	This section being commented on is intended to be a summary, the details for the alternatives are provided in later sections of the ROD. No change to text.
	38	Para 3	X.B	Groundwater cleanup goals should include meeting VPH/EPH standards. This section must include language regarding development of performance standards for VPH/EPH which will be based upon risk based numbers developed during the IR assessment or Method 1 Standards. The IR assessment shall include a trend analyses to predict future petroleum contaminant migration and concentration estimates.	The following text was added at the end of Section X.B. "Risk based clean-up goals will be established for EPH/VPH during the Monitored Natural Attenuation Assessment." It is anticipated that a trend analysis will be a component of the Monitored Natural Attenuation Assessment.
	41	Para 2	X.C.2	Please note that the Army will follow the "Technical Protocol for Implementing Intrinsic Remediation with Long-Term Monitoring for Natural Attenuation of Fuel contamination Dissolved in Groundwater". This document was co-developed by the USEPA and the US Air Force Center for Environmental Excellence and published November 11, 1995.	The desired modification was made.
	41	Para 3	X.C.2	The MADEP recommends that the discussion on institutional controls include restrictions on the use of groundwater, depth of excavation and risk management for any future use.	The specific language for the institutional controls will be developed as part of the property transfer documentation. All regulatory agencies will be provided the opportunity to review and comment on the language at that time.

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
	42	Para 1	X.C.2	The technical discussion of biological degradation of hydrocarbons should be expanded to note the differences between aerobic and anaerobic biodegradation. This discussion should include a description of respective electron acceptors for each condition and discussion regarding the decrease in oxidation-reduction potential for aerobic conditions as progression of electron acceptor use occurs. Note that in anaerobic degradation, the presence of reduced forms of inorganics can be used as an indicator that biological activity is occurring and inorganic speciation can be used to model anaerobic degradation.	The selected remedy performance criteria and details will be provided as part of the required Monitored Natural Attenuation Assessment. No change to text.
	42	Para 2	X.C.2	Please note that final monitoring well locations will be submitted for regulatory review and concurrence.	The following text was added after the 2nd sentence: "A Long Term Monitoring Plan shall be developed as part of the Monitored Natural Attenuation Assessment and shall undergo regulatory review."

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
	42	Para 3	X.C.2	Please specify that relevant chemicals of potential concern (CPC) will include total petroleum hydrocarbons (TPHC) as evaluated using the MADEP's volatile petroleum hydrocarbon (VPH) and extractable petroleum hydrocarbon (EPH) methods. Please note that an intrinsic bioremediation assessment will be conducted. A work plan should be prepared detailing the proposed activities of the assessment and submitted to the regulatory agencies for review prior to implementation. The additional data collection will consist of additional rounds of groundwater sampling and analysis to refine estimates of IR effectiveness. Collected data should include groundwater elevation, intrinsic bioremediation indicators and CPCs. The CPCs should be listed in the ROD and TPHC include analysis using the MADEP's VPH/EPH method. CPC concentration data will be used in the estimation of site specific degradation rates and the effectiveness of IR in achieving groundwater cleanup levels. The ROD should state that the Intrinsic Bioremediation Work plan will contain procedures for evaluation of CPCs and TPHC (using VPH/EPH) and that criteria for contaminant evaluations will use risk based concentrations, MCLs and/or MMCls. Data collected from the intrinsic bioremediation assessment groundwater sampling program must be incorporated into the fate and transport modeling specified in this paragraph.	Part 1. The 3rd sentence has been revised to read: "Data collected would include groundwater elevation, intrinsic remediation indicators, and relevant COPCs, including TPHC by MADEP Methods for extractable petroleum hydrocarbon (EPH) and volatile petroleum hydrocarbons (VPH). Part 2. The 2nd sentence has been revised to read: "Data collection may consist of installing additional monitoring wells and performing additional rounds of groundwater sampling and analysis to refine estimates of intrinsic remediation effectiveness in protecting downgradient receptors. The following text has been added after the second sentence: "A Monitored Natural Attenuation Assessment Work Plan will be developed by the Army and provided for regulatory review." The 3rd sentence has been revised to read: "Data collected would include groundwater elevation, intrinsic remediation indicators, and relevant COPCs, including TPHC by MADEP Methods for extractable petroleum hydrocarbon (EPH) and volatile petroleum hydrocarbon (VPH." Part 3. The last sentence has been revised to read: "Relevant COPC concentration data, including VPH/EPH via MADEP Method will directly assist..."

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
	42	Para 4	X.C.2	Please detail the analytical parameters likely to be included in the monitoring program either in this paragraph or as a separate appendix. Please note that groundwater monitoring will be conducted for thirty years. Additionally, the final Long Term Groundwater Monitoring Plan shall include performance standards that will determine the effectiveness of the remedial action,. The final plan would be developed in conjunction with regulatory review and comment.	Likely analytical parameters for the Monitored Natural Attenuation Assessment are provided in table 18, appendix E. The last sentence has been revised to read: "Groundwater monitoring will be conducted annually for 30 years or until groundwater contamination has been reduced to acceptable levels." The following text has been added to the end of the paragraph: "The Army may request a reduction in the frequency of groundwater monitoring if warranted by site conditions. Annual monitoring will be required unless EPA and MADEP agree to a reduced frequency. A Long Term Monitoring Plan will be developed by the Army and provided for regulatory review."
	43	Para 1	X.C.2	The ROD must note that if at any time during the implementation of the remedy, there are indications that site groundwater contaminants are increasing or spreading, than more aggressive remedial action will be taken to enhance he intrinsic bioremediation alternative.	Paragraph 6 on page 42 provides language that requires that assessment of the effectiveness of the selected remedy every five years. If the selected remedy does not continue to be protective of human health and the environment, the Army will evaluate and implement other measures to ensure the appropriate level of protection.
	8-44	-	Table 1-10	Please include VPH/EPH in table for DRMO Yard.	The parameter has been added.
	8-30	-	Table 8-6	Please include VPH/EPH in table for POL Yard.	The parameter has been added.
Bob Burkhardt	-	-	-	No mention is made of the possibility of the two groundwater OUs contaminating adjacent groundwater via plumes. Are there investigatory findings which justify this conclusion? If so, could you briefly summarize them. What is your best guess about where the soil will be disposed of off-site, and the situation and conditions it will be contained in?	The groundwater modeling performed as part of the remedial investigation examined the possibility of ground water contaminant migration. The results are presented in the RI and were taken into consideration when preparing the FS and this ROD. It is not yet possible to identify possible disposal locations.

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
James Byrne, USEPA New England November 7, 1997	-	-	-	Overall, this Record Of Decision (ROD) should be structured in a similar fashion to that of AOCs 43G & J in that we are dealing with similar issues and remedies.	The specific EPA comments provided below will be responded to in a manner consistent with the 43G and J ROD. Language will be taken from the 43G and J ROD and modified to address the site specific requirements of the AOC 32 and 43A sites.
-	-	-	-	**The Remedy: a.** Cleanup levels for the contaminants of concern (COCs) need to specifically called out in the ROD. **b.** An estimated time frame for meeting these cleanup levels should also be discussed. **c.** Provisions for the evaluation and implementation of "contingency remedy" (i.e. more aggressive action) needs to be added to the remedy. **d.** The concept of a point of compliance needs to be discussed for the monitored natural attenuation portion of the remedy. It should say that one will be established based on cleanup goals and that it will allow us enough time to evaluate the need and implementation of a more aggressive remedy before either human health or the environment are threatened.	**a.** ROD Sections X.A. *Surface Soil Cleanup Levels (Defense Reutilization and Marketing Office Yard Soils Operable Unit - Area of Contamination 32* and X.B. *Groundwater Cleanup Levels* provide the methodology for selection of the soil and groundwater cleanup levels for the sites. Tables delineating the contaminants of concern (COCs) and the cleanup levels agreed upon in the Final Feasibility Study will be provided in the Final ROD. Tables 21 and 22 present the Main Post Soil and Groundwater Cleanup Goal Determinations, respectively. Cleanup goals for MADEP EPH/VPH will be established as part of the Natural Attenuation Assessment Work Plan. **b.** No detailed evaluation has been done to predict the time frame for meeting the cleanup levels. The Army proposes that if the sites cannot be remediated via Natural Attenuation within 30 years that other alternatives will be evaluated. This information will be added to the Final ROD. **c.** Provisions for evaluation and potential implementation of other alternatives if Monitored Natural Attenuation proves to be ineffective will be added to the Final ROD. **d.** The point of compliance for these sites shall be the currently established groundwater Zone II boundary. Monitoring points shall be established at areas sufficiently inside the boundary to provide adequate time to evaluate the need for more aggressive actions to protect human health and the environment. Specific details will be provided in the Natural Attenuation Assessment Work Plan to be submitted after ROD finalization.

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
-	-	-	-	In addition to 5-year reviews, EPA requests that annual groundwater monitoring reports be added to the remedy	Annual groundwater monitoring reports are currently included as part of the remedy. See ROD sections X.C.2 and X.C.3. Each of the referenced sections contain a paragraph titled *Monitor Groundwater Over the Longterm and Annually Report on Groundwater Quality* which describes annual reporting requirements.
-	-	-	-	**ARARs:** We expected that the ARARs would follow those of 43 G and J, but we find that they differ. **a.** Specifically, 43 G and J include RCRA Subtitle C, Subpart F as "Relevant and Appropriate" establishing a groundwater protection standard as an action specific ARAR. The present ROD does not include this ARAR. Please include or justify why it is not included. **d.** The last two pages of Table 23 include TBC ARARs that do not appear in 43 G and J. Please delete or justify their inclusion. Additionally, the first Chemical specific entry for TSCA needs to have a "status" (e.g. applicable or relevant and appropriate) identified. **e.** The two entries under "Action Specific" should also be eliminated. A reference in the text that states "If hazardous waste is found, RCRA Subtitle C will apply, and the waste will be properly disposed" should be included. Perhaps p. 25 would be a good place for this entry.	a) The indicated ARA has been added. d) The ARARs in the AOC 43G and 43J ROD pertains to groundwater and treatment residues. Soil will be excavated as part of the remedial action at AOC 32. The ARARs included are those listed in the January 1997 feasibility study for this site. These ARARs and TBC can be found on Table 5-14 of the feasibility study. e) The action specific ARARs have been eliminated. The following sentence was added to the text on page 39 "If hazardous waste is found, RCRA Subtitle C will apply, and the waste will be properly disposed.
-	12	34	-	"May be site related PCBs" is not a correct statement. There are site related PCBs.	The indicated change was made.
-	14	20	-	PCBs "could be of concern." PCBs are of concern.	The indicated change was made.

RECORD OF DECISION					
Reviewed By:	**Page:**	**Line:**	**Section:**	**Comment:**	**Comment Response:**
	28	-	Institutional controls	How would be they instituted? How long would they be in place? Who would enforce them? Deed restrictions can only be created if a property interest is transferred. If the property is sold, then who would enforce them? How can deed restrictions be attached if the property is not sold? Please clarify.	The Army will maintain control of the property associated with AOCs 32 and 43A until such time that the remedy is deemed to be operating successfully. While the Army maintains ownership of the property the Army will be responsible for ensuring that drinking water wells are no installed in an area that would be impacted by the AOCs. When the property is transferred the restriction would be written into the deed for the property and the new property owner is responsible for enforcing the deed restrictions. The deed restriction would be required until such time that the site is determined to meet the appropriate groundwater cleanup goals.
John Salvadore MADEP November 6, 1997	2	-	-	However, in the source area at Underground Storage Tank #13, Groundwater Operable Unit AOC 32, contaminants of potential concern, 1, 2-1, 3-, and 1,4 dichlorobenzene; Aroclor 1260; DDT; 1,2-dichloroethylene (DCE); and TCE, exceeded Federal and State drinking water standards in the groundwater. Benzene was detected just below the MCL of (5) parts per billion in groundwater. The (2) existing shallow cored bedrock monitoring wells do not provide adequate hydraulic yield for well purging and sampling of these contaminants. MADEP recommends that the (3) shallow monitoring wells proposed for the Underground Storage Tank #13 Groundwater Operable Unit AOC 32, be substituted with (3) rotary drilled monitoring wells installed into consolidated bedrock. The monitoring wells should be installed to a depth to provide a sustainable groundwater yield for sampling.	Additional bedrock monitoring wells are currently planned for the UST # 13 Area. Specific details for the installation of the additional monitoring wells will be provided in the Natural Attenuation Assessment Work Plan.

APPENDIX E — TABLES

Results in the following tables have been coded as follows:

B: Attributable to field or laboratory contamination.
C: Confirmed by reanalysis (second column).
J: Estimated Value.
K: Result biased high.
L: Result biased low.
R: Result rejected.
U: Unconfirmed (reanalysis performed, compound not found).

Bold results exceed screening values developed in Section 4.

N/A = Not Available

Field Sample Numbering System (8 Characters):

Character 1	2	3 and 4	5 and 6	7 and 8
Sample Type: M = groundwater S = surface water B = subsurface soil D = sediment W = surface water E = excavation trenches C = asphalt core	QC type: X = regular sample F = filtered sample D = field duplicate	AOC designator	Number of boring, Monitoring well, or sample, i.e., (00 to 99)	Depth indicator for borings borings (i.e., 01 to 99) or the round number for all other samples (i.e., X1 for round 1, X2 for round 2)

File Type: CSO
Site Type: AREA

Table 1
Chemical Summary Report For Surficial Soils
Area of Contamination: 32
Units: UGG

Part 1 of 3

		Site ID	32S-92-01X	32S-92-02X	32S-92-03X	32S-93-04X	32S-92-05X	32S-92-05X
		Field Sample ID	SX3201X1	SX3202X1	SX3203X1	SX3204X1	SD3205X1	SX3205X1
		Sample Date	10/17/92	10/17/92	10/17/92	10/17/92	10/17/92	10/17/92
Test	Parameter	Screening Values						
TAL METAL	Aluminum	1000000 ugg	6160	6150	5180	6350	9790	10300
	Antimony	40 ugg	<1.09	1.47	<1.09	<1.09	1.98	<1.09
	Arsenic	30 ugg	33.0 J	23.0 J	5.47 J	16.0 J	18.0	19.0 J
	Barium	72000 ugg	26.8	43.6	14.6	31.5	37.1	52.8
	Beryllium	0.80 ugg	0.561	0.654	<0.500	<0.500	<0.500	<0.500
	Cadmium	80 ugg	<0.700	1.79	<0.700	<0.700	2.55	3.22
	Calcium	N/A	1230	845	113	497	674	672
	Chromium (total)	2500 ugg	27.8	26.6	5.94	18.8	35.6	36.5
	Cobalt	N/A	8.30	5.73	2.49	3.52	4.05	4.24
	Copper	38000 ugg	24.4	26.2	3.87	12.6	48.3	50.7
	Iron	N/A	15100	15100	4940	9600	12300 B	13600
	Lead	500 ugg	44.0	560	8.43	190	160	170
	Magnesium	N/A	4190	3820	920	3530	3010	3090
	Manganese	5100 ugg	320 J	288 J	74.0 J	144 J	126 B	136 J
	Mercury	60 ugg	<0.050	<0.050	<0.050	0.053	0.225	0.190
	Nickel	700 ugg	36.0	26.8	5.05	15.0	17.2	18.5
	Potassium	N/A	836	981	293	1290	788	956
	Selenium	2500 ugg	<0.250	<0.250	<0.250	0.517	0.825	0.918
	Sodium	N/A	206	213	161	202	322	324
	Vanadium	7200 ugg	17.5	15.2	5.81	13.2	25.9	28.0
	Zinc	2500 ugg	76.8	258	18.6	69.4	92.4	108
TCL BNA	1-Methylnaphthalene	N/A						
	2,6,10,14-Tetramethylpentade	N/A						
	2-Methylnapthalene	0.70 ugg						
	Chrysene	0.70 ugg						
	Decane	N/A						
TCL BNA	Dibenzofuran	N/A						
	Eicosane	N/A						
	Fluorene	400 ugg						

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: AREA

Table 1
Chemical Summary Report For Surficial Soils
Area of Contamination: 32
Units: UGG

Part 1 of 3

		Site ID	32S-92-01X	32S-92-02X	32S-92-03X	32S-93-04X	32S-92-05X	32S-92-05X
		Field Sample ID	SX3201X1	SX3202X1	SX3203X1	SX3204X1	SD3205X1	SX3205X1
		Sample Date	10/17/92	10/17/92	10/17/92	10/17/92	10/17/92	10/17/92
Test	Parameter	Screening Values						
	Hendecane/ Undecaner	N/A						
	Heptadecane	N/A						
	Hexadecane	N/A						
	Napthalene	4.0 ugg						
	Octadecane	N/A						
	Pentadecane	N/A						
	Phenanthrene	700 ugg						
	Pyrene	500 ugg						
	Tetracosane	N/A						
	Tetradecane	N/A						
TCL BNA	Tridecane	N/A						
	DDD	3.0 ugg	<0.008	<0.008	<0.008	<0.008	0.025 CJ	0.011 CJ
	DDE	2.0 ugg	<0.008	0.018 C	<0.008	0.018 C	0.040 C	0.024 C
	DDT	2.0 ugg	<0.007	<0.007	<0.007	0.0150 C	0.210 C	0.150 C
	PCB1254	2.0 ugg	<0.082	0.119 C	<0.082	<0.082	0.226 JC	<0.082 J
	PCB1260	2.0 ugg	<0.080	<0.080	<0.080	<0.080	<0.080 J	0.217 JC
	gamma-Chlorane	2.0 ugg	<0.005	<0.005	<0.005	<0.005	0.007 C	<0.005
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	2500 ugg	59.5 K	27500	<28.5	259	327 B	337
WQP	PH	N/A						

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: AREA

Table 1
Chemical Summary Report For Surficial Soils
Area of Contamination: 32
Units: UGG

Part 2 of 3

		Site ID	32S-92-06X	32S-92-07X	32S-92-08X	32S-93-09X	32S-93-09X	32S-93-10X
		Field Sample ID	SX3206X1	SX3207X1	SX3208X1	SD3209X1	SX3209X1	SX3210X1
		Sample Date	10/17/92	10/17/92	10/19/92	03/04/93	03/04/93	03/04/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	1000000 ugg	4860	5360	6920	9780 K	7990 K	2490 K
	Antimony	40 ugg	<1.09	3.54	<1.09	<1.09	<1.09	<1.09
	Arsenic	30 ugg	6.43 J	14.0 J	10.2 J	**41.0**	**44.0 J**	29.0 J
	Barium	72000 ugg	33.8	35.1	44.5	106	89.9	23.8
	Beryllium	0.80 ugg	<0.500	<0.500	0.682	<0.500	<0.500	<0.500
	Cadmium	80 ugg	<0.700	4.87	3.35	<0.700	<0.700	<0.700
	Calcium	N/A	717	386	1520	5200	5110	915
	Chromium (total)	2500 ugg	8.13	22.7	20.4	36.8	28.4	10.5
	Cobalt	N/A	3.58	3.59	4.73	6.70	6.48	3.13
	Copper	38000 ugg	9.10	51.6	8.90	42.0	35.9	7.22
	Iron	N/A	8220	12800	7240	26700	21100	7600
	Lead	500 ugg	20.0	150	19.0	130	150	27.0
	Magnesium	N/A	1170	2330	2140	3590	2880	1310
TAL METAL	Mangnese	5100 ugg	259 J	155 J	234 J	551	499 J	76.5 J
	Mercury	60 ugg	<0.050	0.234	0.063	0.177	<0.050	<0.050
	Nickel	700 ugg	11.2	15.9	16.7	30.1	26.3	9.17
	Potassium	N/A	330	948	608	1780	1520	906
	Selenium	2500 ugg	<0.250	0.545	0.648	5.32	5.42	1.64 B
	Sodium	N/A	257	215	242	790	700	318
	Vanadium	7200 ugg	7.98	16.6	14.7	37.0	30.6	9.76
	Zinc	2500 ugg	39.8	83.5	67.4	254	235	21.9
TCL BNA	1-Methylnphthalene	N/A				20.0	20.0	
	2,6,10,14-Tetramethylpentade	N/A				9.00	10.0	
	2-Methylnapthalene	0.70 ugg				**30.0**	**30.0**	<5.00
	Chrysene	0.70 ugg				<1.00	<1.00	<10.00
TCL BNA	Decane	N/A				20.0	20.0	
	Dibenofuran	N/A				3.00	6.00	<4.00
	Eiosane	N/A						
	Fluorene	400 ugg				<0.300	<0.300	<3.00

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: AREA

Table 1
Chemical Summary Report For Surficial Soils
Area of Contamination: 32
Units: UGG

Part 2 of 3

		Site ID	32S-92-06X	32S-92-07X	32S-92-08X	32S-93-09X	32S-93-09X	32S-93-10X
		Field Sample ID	SX3206X1	SX3207X1	SX3208X1	SD3209X1	SX3209X1	SX3210X1
		Sample Date	10/17/92	10/17/92	10/19/92	03/04/93	03/04/93	03/04/93
Test	Parameter	Screening Values						
	Hendecane/Undecane	N/A				10.0	10.0	
	Heptadecane	N/A						
	Hexadecane	N/A						
	Napthalene	4.0 ugg				**20.0**	**20.0**	<4.00
	Octadecane	N/A						
	Pentadecane	N/A						
	Phenanthrene	700 ugg				10.0	10.0	<3.00
	Pyrene	500 ugg				3.00	3.00	<3.00
	Tetracosane	N/A					10.0	
TCL BNA	Tetradecane	N/A						
	Tridecane	N/A				9.00	8.00	
TCL Pest	DDD	3.0 ugg	<0.008	<0.008	<0.008			
	DDE	2.0 ugg	0.019 C	0.035 C	<0.008			
TCL Pest	DDT	2.0 ugg	**2.90 C**	0.140 C	<0.007			
	PCB1254	2.0 ugg	<0.082	<0.082	<0.082			
	PCB1260	2.0 ugg	0.113 C	0.266 C	<0.080			
	gamma-Chlordane	2.0 ugg	<0.005	<0.005	<0.005			
TOC	Total Organic Carbon	N/A				297000	490000	352000
TPHC	Tot. Petroleum Hydrocarbons	2500 ugg	171	165	57.6 K			
WQP	PH	N/A				5.87	5.56	6.05

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: AREA

Table 1
Chemical Summary Report For Surficial Soils
Area of Contamination: 32
Units: UGG

Part 3 of 3

		Site ID	32S-93-11X	32S-93-12X	32S-93-13X			
		Field Sample ID	SX3211X1	SX3212X1	SX3213X1			
		Sample Date	03/04/93	03/04/93	03/04/93			
Test	Parameter	Screening Values						
TAL METAL	Aluminum	1000000 ugg	1220 K	265 K	3390 K			
	Antimony	40 ugg	<1.09	<1.09	<1.09			
	Arsenic	30 ugg	18.0 J	2.85 J	9.69 J			
	Barium	72000 ugg	90.1	<5.18	17.1			
	Beryllium	0.80 ugg	<0.500	<0.500	<0.500			
	Cadmium	80 ugg	<0.700	<0.700	<0.700			
	Calcium	N/A	2490	222	1290			
	Chromium (total)	2500 ugg	<4.05	<4.05	10.7			
	Cobalt	N/A	<1.42	<1.42	2.85			
	Copper	38000 ugg	8.04	1.87	9.90			
	Iron	N/A	8570	2610	7650			
	Lead	500 ugg	27.0	9.90	26.0			
	Magnesium	N/A	490	166	1700			
TAL METAL	Manganese	5100 ugg	29.6 J	3.99 J	87.2 J			
	Mercury	60 ugg	0.145	0.064	<0.050			
	Nickel	700 ugg	4.04	<1.71	11.2			
	Potassium	N/A	503	207	712			
	Selenium	2500 ugg	2.82	2.39	0.433 B			
	Sodium	N/A	279	229	281			
	Vanadium	7200 ugg	9.24	5.73	11.5			
	Zinc	2500 ugg	<8.03	<8.03	19.7			
TCL BNA	1-Methylnaphthalene	N/A	10.0	7.00				
	2,6,10,14-Tetramethylpentade	N/A	10.0	7.00				
	2-Methylnapthalene	0.70 ugg	**10.0**	**7.00**	**4.00**			
	Chrysene	0.70 ugg	**3.00**	<1.00	<1.00			
	Decane	N/A		9.00				
TCL BNA	Dibenzofuran	N/A	4.00	1.00	0.800			
	Eicosane	N/A	4.00	6.00				
	Fluorene	400 ugg	<0.300	0.700	<0.300			

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: AREA

Table 1
Chemical Summary Report For Surficial Soils
Area of Contamination: 32
Units: UGG

Part 3 of 3

		Site ID	32S-93-11X	32S-93-12X	32S-93-13X			
		Field Sample ID	SX3211X1	SX3212X1	SX3213X1			
		Sample Date	03/04/93	03/04/93	03/04/93			
Test	Parameter	Screening Values						
	Hendecane/Undecane	N/A		10.0				
	Heptadecane	N/A	4.00	7.00				
	Hexadecane	N/A		8.00				
	Napthalene	4.0 ugg	**10.0**	**4.00**	3.00			
	Octadecane	N/A	4.00	6.00				
	Pentadecane	N/A		8.00				
	Phenanthrene	700 ugg	6.00	7.00	2.00			
	Pyrene	500 ugg	<0.300	<0.300	<0.300			
	Tetracosane	N/A		9.00				
	Tetradecane	N/A		10.0				
	Tridecane	N/A	5.00	10.0				
TCL Pest	DDD	3.0 ugg						
	DDE	2.0 ugg						
	DDT	2.0 ugg						
	PCB1254	2.0 ugg						
	PCB1260	2.0 ugg						
	gamma-Chlordane	2.0 ugg						
TOC	Total Organic Carbon	N/A	317000	267000	15000			
TPHC	Tot. Petroleum Hydrocarbons	2500 ugg						
WQP	PH	N/A	6.69	4.35	6.20			

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 1 of 9

		Site ID	32B-92-01X	32B-92-01X	32B-92-01X	32B-92-02X	32B-92-02X	32B-92-02X
		Field Sample ID	BX320101	BX320102	BX320103	BX320201	BX320202	BX320203
		Sample Date	10/19/92	10/19/92	10/19/92	10/19/92	10/19/92	10/19/92
Test	Parameter	Screening Values	1.0 ft.	5.0 ft.	10.0 ft.	1.0 ft.	5.0 ft.	10.0 ft.
TAL METAL	Aluminum	1000000 ugg	5750	6560	2790	3160	3760	3430
	Antimony	40 ugg	<1.09	<1.09	<1.09	<1.09	<1.09	<1.09
	Arsenic	30 ugg	11.4	867	11.1	19.0	10.1	15.0
	Barium	72000 ugg	67.9	29.9	14.1	25.7	14.6	14.1
	Beryllium	3.0 ugg	<0.500	<0.500	<0.500	0.694	<0.500	<0.500
	Cadmium	80 ugg	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700
	Calcium	N/A	1840	701	418	448	130	205
	Chromium (total)	5000 ugg	15.6	17.4	9.25	7.99	9.94	12.0
	Cobalt	N/A	3.15	3.91	3.03	2.24	<1.42	<1.42
	Copper	38000 ugg	7.91	10.2	6.96	15.1	5.83	6.85
	Iron	N/A	8870 J	7790 J	6350 J	11700 J	6960 J	8330 J
	Lead	500 ugg	13.0 J	4.52 J	3.45 J	24.0 J	5.32 J	4.43 J
	Magnesium	N/A	2300	2390	1420	732	1180	1540
TAL METAL	Manganese	5100 ugg	104	133	139	73.8	57.4	55.4
	Mercury	60 ugg	<0.050	<0.050	<0.050	0.225	<0.050	<0.050
	Nickel	700 ugg	10.9	13.3	11.5	6.10	6.02	8.53
	Potassium	N/A	1140	823	375 K	321 K	453 K	386 K
	Selenium	2500 ugg	<0.250	<0.250	<0.250	0.892 J	<0.250	<0.250
	Silver	200 ugg	<0.589	<0.589	<0.589	<0.589	<0.589	<0.589
	Sodium	N/A	372	298	257	204	173	179
	Vanadium	7200 ugg	13.6	10.6	5.11	10.6	6.58	6.60
	Zinc	5000 ugg	18.9	21.4	15.7	16.0	13.8	13.9
TCL Pest	DDD	10 ugg	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDE	9.0 ugg	<0.008	<0.008	<0.008	0.012 C	<0.008	<0.008
	DDT	9.0 ugg	0.014 C	<0.007	<0.007	0.065 C	<0.007	<0.007
	Heptachlor epoxide	0.30 ugg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
TCL PEST	PCB1254	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
	PCB1260	2.0 ugg	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
TOC	Total Organic Carbon	N/A						
TPHC	To. Pet. Hydrocarbons	5000 ugg	<2.87	<2.85	<28.5	842	<28.5	<28.5

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 2 of 9

		Site ID	32B-92-03X	32B-92-03X	32B-92-03X	32B-92-04X	32B-92-04X	32B-92-04X
		Field Sample ID	BX320301	BX320302	BX320303	BX320401	BX320402	BX320403
		Sample Date	10/19/92	10/19/92	10/19/92	10/19/92	10/19/92	10/19/92
Test	Parameter	Screening Values	1.0 ft.	5.0 ft.	12.0 ft.	0.0 ft.	5.0 ft.	10.0 ft.
TAL METAL	Aluminum	1000000 ugg	2120	6400	3170	6300	3030	2450
	Antimony	40 ugg	<1.09	<1.09	<1.09	<1.09	<1.09	<1.09
	Arsenic	30 ugg	8.96	11.2	13.0	15.0	7.04	13.0
	Barium	72000 ugg	46.5	21.2	13.8	30.5	12.9	9.91
	Beryllium	3.0 ugg	<0.500	0.614	<0.500	0.792	<0.500	<0.500
	Cadmium	80 ugg	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700
	Calcium	N/A	415	398	243	4130	241	236
	Chromium (total)	5000 ugg	9.75	26.1	8.42	14.9	6.06	6.45
	Cobalt	N/A	2.18	2.74	<1.42	4.96	2.17	1.96
	Copper	38000 ugg	20.0	10.8	6.13	17.9	4.95	4.62
	Iron	N/A	19500 J	10300 J	6630 J	12300 J	4400 J	4430 J
	Lead	500 ugg	33.0 J	6.53 J	3.21 J	980 J	100 J	7.42 J
TAL METAL	Magnesium	N/A	719	2950	1610	2450	940	1120
	Manganese	5100 ugg	281	110	87.8	243	73.6	82.0
	Mercury	60 ugg	0.073	<0.050	<0.050	<0.050	<0.050	<0.050
	Nickel	700 ugg	7.35	15.7	8.73	22.6	6.58	8.56
	Potassium	N/A	387 K	851	298 K	507	451 K	280 K
	Selenium	2500 ugg	1.68 J	<0.250	<0.250	<0.250	<0.250	<0.250
	Silver	200 ugg	<0.589	<0.589	<0.589	<0.589	<0.589	<0.589
	Sodium	N/A	214	163	170	181	152	167
	Vanadium	7200 ugg	8.87	13.1	5.16	11.2	4.86	<3.39
	Zinc	5000 ugg	14.2	23.8	13.5	76.6	19.4	16.3
TCL Pest	DDD	10 ugg	<0.008	<0.008	<0.008	0.014 C	<0.008	<0.008
	DDE	9.0 ugg	<0.008	<0.008	<0.008	0.087 C	<0.008	<0.008
	DDT	9,0 ugg	0.021 C	<0.007	<0.007	0.320 C	0.014 C	<0.007
TCL Pest	Heptachlor epoxide	0.30 ugg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
	PCB1254	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
	PCB 1260	2.0 ugg	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	2170	30.2	34.6	95.9	30.1	30.2

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 3 of 9

		Site ID	32B-92-05X	32B-92-05X	32B-92-05X	32B-92-06X	32B-92-06X	32B-92-06X
		Field Sample ID	BX320501	BX320502	BX320503	BX320601	BX320602	BX320603
		Sample Date	10/20/92	10/20/92	10/20/92	10/20/92	10/20/92	10/20/92
Test	Parameter	Screening Values	1.0 ft.	5.0 ft.	10.0 ft.	1.0 ft.	5.0 ft.	10.0 ft.
TAL METAL	Aluminum	1000000 ugg	7870	4210	2810	9280	5520	2590
	Antimony	40 ugg	<1.09	<1.09	<1.09	<1.09	<1.09	<1.09
	Arsenic	30 ugg	17.0	17.0	10.5	9.46	21.0	11.0 J
	Barium	72000 ugg	17.5	15.6	10.4	33.2	25.0	12.1
	Beryllium	3.0 ugg	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	Cadmium	80 ugg	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700
	Calcium	N/A	288	305	216	696	371	265
	Chromium (total)	5000 ugg	9.99	10.7	7.73	18.1	14.3	7.55
	Cobalt	N/A	3.01	3.69	2.20	3.28	4.97	2.20
	Copper	38000 ugg	8.33	10.1	5.02	16.3	11.5	4.39
	Iron	N/A	8900 J	7820 J	5520 J	8920 J	10300 J	5050 J
	Lead	500 ugg	13.0 J	7.21 J	2.65 J	49.0 J	11.0 J	2.49 J
	Magnesium	N/A	1190	1720	1470	2020	2470	1090
TAL METAL	Magnanese	5100 ugg	115	149	95.9	108	254	84.5
	Mercury	60 ugg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Nickel	700 ugg	10.5	13.9	9.04	12.6	17.2	8.00
	Potassium	N/A	294 K	534	307 K	648	848	358 K
	Selenium	2500 ugg	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250 J
	Silver	200 ugg	<0.589	<0.589	<0.589	<0.589	<0.589	<0.589
	Sodium	N/A	160	177	151	231	166	152
	Valnadium	7200 ugg	9.59	7.20	4.67	12.5	9.58	4.47
	Zinc	5000 ugg	31.0	30.0	16.5	41.0	29.2	13.0
TCL Pest	DDD	10 ugg	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDE	9.0 ugg	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDT	9.0 ugg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
TCL Pest	Heptachlor epoxide	0.30 ugg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
	PCB1254	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
	PCB1260	2.0 ugg	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	1960	126 K	63.7 B	226 K	251 K	63.1 B

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 4 of 9

		Site ID	32B-92-07X	32B-92-07X	32B-92-07X	32B-92-08X	32B-92-08X	32B-92-08X
		Field Sample ID	BX320701	BX320702	BX320703	BX320802	BX320801	BX320802
		Sample Date	10/20/92	10/20/92	10/20/92	10/20/92	10/20/92	10/20/92
Test	Parameter	Screening Values	1.0 ft.	5.0 ft.	10.0 ft.	5.0 ft.	1.0 ft.	5.0 ft.
TAL METAL	Aluminum	1000000 ugg	13500	6030	2980	7260	8490	6400
	Antimony	40 ugg	7.32	<1.09	<1.09	<1.09	<1.09	<1.09
	Arsenic	30 ugg	23.0	17.0	13.0	15.0	17.0	14.0
	Barium	72000 ugg	214	23.8	13.2	25.1	31.6	25.1
	Beryllium	3.0 ugg	1.20	0.723	<0.500	0.670	0.821	0.555
	Cadmium	80 ugg	6.51	<0.700	<0.700	<0.700	<0.700	<0.700
	Calcium	N/A	2640	507	321	528	568	865
	Chromium (total)	5000 ugg	53.9	17.1	8.11	17.6	19.5	13.2
	Cobalt	N/A	7.35	4.73	2.61	5.65	3.85	4.30
	Copper	38000 ugg	377	16.2	7.04	13.9	11.6	11.3
	Iron	N/A	34300 J	10500 J	5980 J	10900	10600 J	9680 J
	Lead	500 ugg	**670 J**	18.0 J	2.78 J	22.0	28.0 J	25.0 J
	Magnesium	N/A	7010	2820	1550	2830	1890	2260
TAL METAL	Magnanese	5100 ugg	330	168	110	280 B	170	223
	Mercury	60 ugg	0.340	<0.050	<0.050	<0.050	<0.050	<0.050
	Nickel	700 ugg	58.0	15.3	10.6	18.9	14.4	14.1
	Potassium	N/A	3020	954	407 K	805 B	523	736
	Selenium	2500 ugg	0.824 J	<0.250	<0.250	<0.250	<0.250	<0.250
	Silver	200 ugg	0.815	<0.589	<0.589	<0.589	<0.589	<0.589
	Sodium	N/A	253	220	155	212	207	218
	Vanadium	7200 ugg	32.0	10.8	5.23	12.1	12.3	11.6
	Zinc	5000 ugg	976	38.4	18.2	42.3	46.2	34.0
TCL Pest	DDD	10 ugg	6.60 C	0.050 C	<0.008	<0.008	0.010 C	<0.008
	DDE	9.0 ugg	2.70 C	0.064 C	<0.008	0.009 C	<0.008	<0.008
	DDT	9.0 ugg	5.60 C	0.110 C	<0.007	0.042 JC	0.062 C	0.013 JC
	Heptchlor epoxie	0.30 ugg	<0.006	<0.006	<0.006	0.009 JC	<0.006	<0.006 J
PCL Test	PCB1254	2.0 ugg	<0.082	<0.082	<0.082	0.360 JC	<0.082	0.097 JC
	PCB1260	2.0 ugg	0.680 C	<0.080	<0.080	<0.080	<0.080	<0.080
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	1360	193	<28.4	636	255	616

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 5 of 9

		Site ID	32B-92-08X	32B-92-09X	32B-92-09X	32B-92-09X	32B-92-10X	32B-92-10X
		Field Sample ID	BX320803	BX320901	BX320902	BX320903	BX321001	BX321002
		Sample Date	10/20/92	10/20/92	10/20/92	10/20/92	10/20/92	10/20/92
Test	Parameter	Screening Values	10.0 ft.	1.0 ft.	5.0 ft.	10.0 ft.	1.0 ft.	5.0 ft.
TAL METAL	Aluminum	1000000 ugg	3420	6870	5200	2730	7160	5310
	Antimony	40 ugg	<1.09	23.0	<1.09	<1.09	<1.09	<1.09
	Arsenic	30 ugg	**37.0**	7.47	18.0	20.0	4.77	14.0
	Barium	72000 ugg	15.3	24.8	18.9	14.3	22.7	23.8
	Beryllium	3.0 ugg	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	Cadmium	80 ugg	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700
	Calcium	N/A	253	273	441	272	379	314
	Chromium (total)	5000 ugg	9.23	9.22	15.0	7.47	9.53	11.2
	Cobalt	N/A	3.11	2.06	4.21	3.14	2.17	5.14
	Copper	38000 ugg	7.41	22.7	13.8	8.12	12.4	12.2
	Iron	N/A	7190 J	7020 J	9580 J	5500 J	7190 J	9460 J
	Lead	500 ugg	7.75 J	**540 J**	57.0 J	42.0 J	16.0 J	8.06 J
	Magnesium	N/A	1560	1060	2090	1330	1110	2070
TAL METAL	Manganese	N/A	128	72.3	226	**142**	96.8	304
	Mercury	60 ugg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Nickel	700 ugg	13.0	8.35	14.5	9.57	8.37	16.8
	Potassium	N/A	505	310 K	679	349	272 K	702
	Selenium	2500 ugg	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250
	Silver	200 ugg	<0.589	<0.589	<0.589	<0.589	<0.589	<0.589
	Sodium	N/A	187	221	173	193	211	210
	Vanadium	7200 ugg	6.22	8.34	8.90	4.81	8.20	8.23
	Zinc	5000 ugg	24.2	73.9	44.4	20.9	186	38.6
TCL Pest	DDD	10 ugg	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDE	9.0 ugg	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDT	9.0 ugg	0.014 C	0.110 C	0.035 C	0.010 C	0.030 C	0.041 C
	Heptachlor epoxide	0.30 ugg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
TCL Pest	PCB1254	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
	PCB1260	2.0 ugg	<0.080	0.341 C	0.091 C	<0.080 J	<0.080	<0.080
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	138 K	204 K	256	233	120 B	50.0 B

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 6 of 9

			Site ID	32B-92-10X	32B-92-11X	32B-92-11X	32B-92-11X	32B-92-12X	32B-92-12X
			Field Sample ID	BX321003	BX321101	BX321102	BX321103	BX321201	BX321202
			Sample Date	10/20/92	10/19/92	10/19/92	10/19/92	10/20/92	10/20/92
Test	Parameter	Screening Values		10.0 ft.	1.0 ft.	5.0 ft.	10.0 ft.	1.0 ft.	5.0 ft.
TAL METAL	Aluminum	1000000 ugg		2510	6370	10100	5200	9280	7190
	Antimony	40 ugg		<1.09	<1.09	<1.09	<1.09	<1.09	<1.09
	Arsenic	30 ugg		13.0	28.0	20.0	15.0	10.4	18.0
	Barium	72000 ugg		12.0	35.8	48.3	24.6	44.8	34.0
	Beryllium	3.0 ugg		<0.500	0.984	0.693	<0.500	0.709	<0.500
	Cadmium	80 ugg		<0.700	<0.700	<0.700	<0.700	<0.700	<0.700
	Calcium	N/A		267	1480	888	414	1590	853
	Chromium (total)	5000 ugg		7.19	19.4	39.3	20.5	21.9	25.3
	Cobalt	NA		2.02	7.21	7.24	4.91	4.39	6.32
	Copper	38000 ugg		4.87	16.5	11.1	11.9	10.6	15.5
	Iron	N/A		4380 J	12600 J	13500 J	9880 J	11800 J	12600 J
	Lead	500 ugg		2.90 J	55.0 J	15.0 J	5.21 J	12.0 J	18.0 J
	Magnesium	N/A		1090	2510	5450	2400	2940	3590
TAL METAL	Magnanese	5100 ugg		87.3	363	229	208	177	236
	Mercury	60 ugg		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Nickel	700 ugg		8.37	27.0	24.9	16.8	15.3	21.8
	Potassium	N/A		355 K	813	3280	1100	1490	1190
	Selenium	2500 ugg		<0.250	<0.250	<0.250	<0.250	<0.250	<0.250
	Silver	200 ugg		<0.589	<0.589	<0.589	<0.589	<0.589	<0589
	Sodium	N/A		221	224	209	178	269	260
	Vandium	7200 ugg		4.68	11.5	25.0	10.3	15.5	15.3
	Zinc	5000 ugg		15.2	39.4	37.6	26.4	40.8	38.2
TCL Pest	DDD	10 ugg		<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDE	9.0 ugg		<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDT	9.0 ugg		<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
	Heptachlor epoxide	0.30 ugg		<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
TCL Test	PCB1254	2.0 ugg		<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
	PCB1260	2.0 ugg		<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
TOC	Total Organic Carbon	N/A							
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg		40.1 B	1750	469	48.2 B	483	467

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 7 of 9

		Site ID	32B-92-12X	32B-92-13X	32B-92-13X	32B-92-13X	32B-92-14X	32B-92-14X
		Field Sample ID	BX321203	BX321301	BX321302	BX321303	BX321401	BX321402
		Sample Date	10/20/92	10/20/92	10/20/92	10/20/92	10/19/92	10/19/92
Test	Parameter	Screening Values	10.0 ft.	1.0 ft.	5.0 ft.	10.0 ft.	1.0 ft.	5.0 ft.
TAL METAL	Aluminum	1000000 ugg	3880	8840	7060	2350	5140	4980
	Antimony	40 ugg	<1.09	<1.09	<1.09	<1.09	3.11	<1.09
	Arsenic	30 ugg	22.0	10.9	16.0	15.0	19.0	9.46
	Barium	72000 ugg	17.4	34.4	42.2	11.1	74.2	23.4
	Beryllium	3.0 ugg	<0.500	0.738	<0.500	<0.500	0.627	<0.500
	Cadmium	80 ugg	<0.700	<0.700	<0.700	<0.700	2.98	<0.700
	Calcium	N/A	365	585	568	272	1400	477
	Chromium (total)	5000 ugg	14.1	18.6	20.5	5.74	38.4	12.3
	Cobalt	N/A	3.79	4.66	7.57	2.35	4.64	3.47
	Copper	38000 ugg	9.16	18.8	19.0	5.22	53.1	9.43
	Iron	N/A	8300 J	11500 J	11500 J	4910 J	16100 J	7380 J
	Lead	500 ugg	5.03 J	19.0 J	11.1 J	2.02 J	110 J	21.0 J
	Magnesium	N/A	2130	2480	3470	997	2480	1910
TAL METAL	Manganese	5100 ugg	146	203	377	108	199	200
	Mercury	60 ugg	<0.050	<0.050	<0.050	<0.050	0.332	<0.050
	Nickel	700 ugg	15.9	18.2	24.5	9.18	28.1	12.1
	Potassium	N/A	587	575	1040	261 K	1030	666
	Selenium	2500 ugg	<0.250	<0.250	<0.250	<0.250	0.896 J	<0.250
	Silver	200 ugg	<0.589	<0.589	<0.589	<0.589	0.767	0.621
	Sodium	N/A	206	257	223	172	240	188
	Vanadium	7200 ugg	7.63	12.9	12.7	<3.39	17.6	9.14
	Zinc	5000 ugg	27.8	46.4	39.3	13.2	219	44.3
TCL Pest	DDD	10 ugg	<0.008	0.019 C	<0.008	<0.008	<0.008	<0.008
	DDE	9.0 ugg	<0.008	0.018 C	<0.008	<0.008	0.039 C	<0.008
	DDT	9.0 ugg	<0.007	0.052 C	<0.007	0.007	0.110 C	0.014 C
	Heptachlor epoxide	0.30 ugg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
TCL Pest	PCB1254	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
	PCB1260	2.0 ugg	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	171 K	95.1 B	1100	29.8 B	247 K	158 K

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 8 of 9

		Site ID	32B-92-14X	32B-92-15X	32B-92-15X	32B-92-15X	32B-92-15X	32M-92-01X
		Field Sample ID	BX321403	BD321501	BX321501	BX321502	BX321503	MX320101
		Sample Date	10/19/92	10/19/92	10/19/92	10/19/92	10/19/92	10/17/92
Test	Parameter	Screening Values	10.0 ft.	1.0 ft.	1.0 ft.	5.0 ft.	10.0 ft.	22.0 ft.
TAL METAL	Aluminum	1000000 ugg	6820	6400	5730	8030	4660	
	Antimony	40 ugg	<1.09	2.96	2.49	<1.09	<1.09	
	Arsenic	30 ugg	19.0	21.0	19.0	**32.0**	19.0	
	Barium	72000 ugg	41.5	97.8	88.8	37.0	19.6	
	Beryllium	3.0 ugg	<0.500	<0.500 J	0.726 J	<0.500	<0.5.00	
	Cadmium	80 ugg	<0.700	1.42	1.77	<0.700	<0.700	
	Calcium	N/A	597	1350	1880	1170	585	
	Chromium (total)	5000 ugg	51.9	19.8	25.7	35.2	15.0	
	Cobalt	N/A	5.09	4.93	6.23	7.04	4.01	
	Copper	38000 ugg	11.4	37.8 J	72.3 J	17.1	9.02	
	Iron	N/A	10700 J	13200 J	25300 J	13800 J	8640 J	
	Lead	500 ugg	10.9 J	310 J	130 J	23.0 J	8.70 J	
	Magnesium	N/A	3280	2110	2630	4240	2500	
TAL METAL	Manganese	5100 ugg	447	189 B	244	284	174	
	Mercury	60 ugg	<0.050	0.088	0.255	<0.055	<0.050	
	Nickel	700 ugg	17.8	44.4	62.5	27.3	18.8	
	Potassium	N/A	1630	658 B	851	1820	655	
	Selenium	2500 ugg	<0.250	<0.250 J	0.421 J	<0.250	<0.250	
	Silver	200 ugg	<0.589	<0.589	<0.589	<0.589	<0.589	
	Sodium	N/A	220	224	315	223	185	
	Vanadium	7200 ugg	14.7	13.9	14.9	18.0	9.21	
	Zinc	5000 ugg	137	235	224	50.2	27.7	
TCL Pest	DDD	10 ugg	<0.008	<0.008	<0.008	<0.008	<0.008	
	DDE	9.0 ugg	<0.008	0.011 C	0.009 C	<0.008	<0.008	
	DDT	9.0 ugg	<0.007	0.017 C	0.013 C	<0.007	<0.007	
	Heptachlor epoxide	0.30 ugg	<0.006	<0.006	<0.006	<0.006	<0.006	
TCL Pest	PCB1254	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	
	PCB1260	2.0 ugg	<0.080	<0.080	<0.080	<0.080	<0.080	
TOC	Total Organic Carbon	N/A						1160
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	<28.4	332	442	747	156 K	

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 2
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32
Units: UGG

Part 9 of 9

		Site ID	32M-92-02X	32M-92-03X				
		Field Sample ID	MX320201	MX320301				
		Sample Date	10/18/92	10/18/92				
Test	Parameter	Screening Values	24.5 ft.	34.0 ft.				
TAL METAL	Aluminum	1000000 ugg						
	Antimony	40 ugg						
	Arsenic	30 ugg						
	Barium	72000 ugg						
	Beryllium	3.0 ugg						
	Cadmium	80 ugg						
	Calcium	N/A						
	Chromium (total)	5000 ugg						
	Cobalt	N/A						
	Copper	38000 ugg						
	Iron	N/A						
	Lead	500 ugg						
	Magnesium	N/A						
TAL METAL	Manganese	5100 ugg						
	Mercury	60 ugg						
	Nickel	700 ugg						
	Potassium	N/A						
	Selenium	2500 ugg						
	Silver	200 ugg						
	Sodium	N/A						
	Vanadium	7200 ugg						
	Zinc	5000 ugg						
TCL Pest	DDD	10 ugg						
	DDE	9.0 ugg						
	DDT	9.0 ugg						
	Heptachlor epoxide	0.30 ugg						
TCL Pest	PCB1254	2.0 ugg						
	PCB1260	2.0 ugg						
TOC	Total Organic Carbon	N/A	387	722				
TPHC	TPHC	5000 ugg						

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: EXCV

Table 3
Chemical Summary Report For Subsurface Soils
Area of Contamination: 32 (Waste Oil Tank Area)
Units: UGG

Part 1 of 1

		Site ID	32E-92-01X	32E-92-02X	32E-92-03X			
		Field Sample ID	EX320101	EX320201	EX320301			
		Sample Date	10/29/92	10/29/92	10/29/92			
Test	Parameter	Screening Values						
TAL METAL	Aluminum	1000000 ugg	4650	4140	6470			
	Arsenic	30 ugg	**120**	5.26	9.73			
	Barium	72000 ugg	20.3	13.1	31.3			
	Beryllium	3.0 ugg	**0.984**	0.725	**1.13**			
	Cadmium	80 ugg	<0.700	<0.700	1.09			
	Calcium	N/A	731	158	**1390**			
	Chromium (total)	5000 ugg	7.27	5.92	12.4			
	Cobalt	N/A	3.79	2.35	4.18			
	Copper	38000 ugg	6.66	4.18	12.8			
	Iron	N/A	7910	4320	8580			
	Lead	500 ugg	23.0	**76.0**	**1100**			
	Magnesium	N/A	1160	892	1920			
	Manganese	5100 ugg	268	71.3	246			
TAL METAL	Nickel	700 ugg	8.92	5.2	10.8			
	Potassium	N/A	537	251	965			
	Selenium	2500 ugg	0.545	0.354	0.678			
	Sodium	N/A	183	178	183			
	Vanadium	7200 ugg	5.79	5.02	11.0			
	Zinc	5000 ugg	32.2	16.7	**325**			
TCL Pest	DDE	9.0 ugg	<0.008	<0.008	0.016 C			
	DDT	9.0 ugg	<0.007	<0.015 C	**0.300 C**			
TCL VOA	Acetone	3 ugg	<0.017	0.039	<0.017			
	Chloroform	0.1 ugg	0.002	<0.001	<0.001			
	Trichlorofluoromethane	31000 ugg	<0.006	0.006	0.006			
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	<28.5	1190	1190			

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: AREA

Table 4
Chemical Summary Report For Surficial Soils
Area of Contamination: 43A
Units UGG

Part 1 of 2

		Site ID	43SA93-01X	43SA93-01X	43SA93-02X	43SA93-03X	43SA93-04X	43SA93-05X
		Field Sample ID	SD4301X1	SX4301X1	SX4302X1	SX4303X1	SX4304X1	SX4305X1
		Sample Date	07/14/93	07/14/93	07/14/93	07/14/93	07/14/93	07/14/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	1000000 ugg	7600	6700	6000	6400	4900	6000
	Arsenic	30 ugg	13.0	13.0	6.22	4.98	8.17	7.62
	Barium	72000 ugg	20.9	17.7	19.1	22.0	26.0	23.3
	Calcium	N/A	1130	660	791	1930	1240	1700
	Chromium (total)	2500 ugg	24.9	**18.8**	13.2	17.9	12.2	21.7
	Cobalt	N/A	8.02	7.53	5.57	6.71	5.88	7.84
	Copper	38000 ugg	15.3	14.9	9.91	1.05	13.7	13.5
	Iron	N/A	12000	11000	7800	9700	7800	12000
	Lead	500 ugg	100	56.0	23.0	49.0	50.0	83.0
	Magnesium	N/A	3070	2560	1770	2720	1890	3110
	Manganese	5100 ugg	210	210	180	180	150	220
	Nickel	700 ugg	20.0	**18.1**	11.9	15.1	12.0	18.5
	Potassium	N/A	1030	847	788	1080	634	970
TAL METAL	Sodium	N/A	236	<200	<200	<200	<200	<200
	Vanadium	7200 ugg	20.8	17.8	11.4	14.8	14.1	17.2
	Zinc	2500 ugg	68.2	60.8	27.5	34.5	51.2	74.5
TCL BNA	Benzo [A] anthracene	0.70 ugg	<0.330	<0.330	<0.330	<0.330	<0.330	<0.330
	Benzo [A] pyrene	0.70 ugg	<0.330	<0.330	<0.330	<0.330	<0.330	<0.330
	Benzo [B] flouranthene	0.70 ugg	0.380	0.130 J	<0.330	<0.330	0.460	0.110 J
	Benzo [G,H,I] perylene	30 ugg	0.160 J	<0.330	<0.330	<0.330	<0.330	<0.330
	Benzo [K] fluorathene	0.70 ugg	0.140 J	<0.330	<0.330	<0.330	0.120 J	<0.330
	Chrysene	0.70 ugg	0.330	<0.330	<0.330	<0.330	<0.330	<0.330
	Fluoranthene	600 ugg	0.700	0.130 J	<0.330	<0.330	0.500	0.120 J
TCL BNA	Heptadecane	N/A					0.270	
	Indeno [1,2,3-C,D] pyrene	0.70 ugg	0.190 J	0.064 J	<0.330	<0.330	0.230 J	<0.330
	Pyrene	500 ugg	0.580	0.110 J	<0.330	<0.330	0.430	0.110 J
TCL Pest	DDD	3.0 ugg	<0.010	<0.010	<0.008	<0.002	<0.080	<0.020
	DDE	2.0 ugg	0.016 C	0.017 C	<0.008	0.002 C	0.100 C	0.034 C
	DDT	2.0 ugg	0.070 C	0.075 C	0.006 JC	0.014 C	0.240 C	0.010 JC
	alpha-Benzenehexachloride	0.45 ugg	<0.005	<0.005	<0.004	<0.001	<0.040	0.011 JU
TPHC	Tot. Petroleum Hydrocarbons	2500 ugg	<20.0	20.3	<20.0	<20.0	27.8	27.6

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: AREA

Table 4
Chemical Summary Report For Surficial Soils
Area of Contamination: 43A
Units: UGG

Part 2 of 2

		Site ID	43SA93-06X	43SA93-07X	43SA93-08X	43SA93-09X	43SA93-10X	
		Field Sample ID	SX4306X1	SX4307X1	SX4308X1	SX4309X1	SX4310X1	
		Sample Date	07/14/93	07/14/93	07/14/93	07/14/93	07/14/93	
Test	Parameter	Screening Values						
TAL METAL	Aluminum	1000000 ugg	6100	4400	5400	3800	5300	
	Arsenic	30 ugg	6.37	6.51	6.15	3.75	**210**	
	Barium	72000 ugg	27.5	19.6	41.1	33. 7	24.5	
	Calcium	N/A	1790	1280	1500	1370	2020	
	Chromium (total)	2500 ugg	24.6	18.1	25.2	18.8	17.8	
	Cobalt	N/A	7.09	57.6	6.37	4.20	51.3	
	Copper	38000 ugg	13.1	11.0	14.6	10.1	11.9	
	Iron	N/A	11000	9100	9200	6400	7200	
	Lead	500 ugg	49.0	41.0	83.0	70.0	49.0	
	Magnesium	N/A	3460	2650	2890	1530	2150	
	Manganese	5100 ugg	190	170	180	98.0	140	
	Nickel	700 ugg	18.4	15.5	15.9	9.22	11.0	
	Potassium	N/A	1430	727	1420	661	1070	
TAL METAL	Sodium	N/A	221	<200	<200	256	219	
	Vanadium	7200 ugg	18.3	13.6	18.3	13.7	12.6	
	Zinc	2500 ugg	73.2	41.7	54.2	42.1	29.2	
TCL BNA	Benzo [A] anthracene	0.70 ugg	<0.330	<0.330	<0.330	**2.00**	<0.330	
	Benzo [A] pyrene	0.70 ugg	<0.330	<0.330	<0.330	**2.00**	<0.330	
	Benzo [B] flouranthene	0.70 ugg	0.220 J	0.084 J	0.590	**4.00**	<0.330	
	Benzo [G,H,I] perylene	30 ugg	<0.330	<0.330	<0.330	2.00 J	<0.330	
	Benzo [K] fluoranthene	0.70 ugg	<0.330	<0.330	<0.330	<2.00	<0.330	
	Chrysene	0.70 ugg	<0.330	<0.330	<0.330	**2.00**	<0.330	
	Fluoranthene	600 ugg	0.290 J	<0.330	0.600	4.00	0.110 J	
	Heptadecane	N/A						
TCL BNA	Indeno[1,2,3-C,D] pyrene	0.70 ugg	<0.330	<0.330	0.280 J	**2.00**	<0.330	
	Pyrene	500 ugg	0.280 J	0.093 J	0.460	3.00	0.078	
TCL Pest	DDD	3.0 ugg	<0.010	<0.008	<0.040	<0.040	0.003 JC	
	DDE	2.0 ugg	0.010 C	0.005 JC	0.030 JC	<0.400	<0.010 JC	
	DDT	2.0 ugg	0.063 C	0.020 C	0.170 C	0.430 C	0.026 JC	
	alpha-Benzenehexachloride	0.45 ugg	0.009 JU	<0.004	<0.020	<0.200	<0.002	
TPHC	Tot. Petroleum Hydrocarbons	2500 ugg	22.5	28.9	102	80.0	40.7	

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 1 of 4

		Site ID	43BA93-01X	43BA93-01X	43BA93-01X	43BA93-01X	43BA93-02X	43BA93-02X
		Field Sample ID	BD430101	BX430101	BX430102	BX430103	BX430201	BX430202
		Sample Date	07/27/93	07/27/93	07/27/93	07/27/93	07/29/93	07/29/93
Test	Parameter	Screening Values	20.0 ft.	20.0 ft.	25.0 ft.	30.0 ft.	23.0 ft.	28.0 ft.
TAL METAL	Aluminum	1000000 ugg	4000	4000	4900	5000	3500	2800
	Arsenic	30 ugg	12.9	14.0	21.0	27.0	12.0	6.74
	Barium	72000 ugg	12.9	11.6	18.3	20.3	11.7	12.1
	Beryllium	3.0 ugg	0.241 J	0.230 J	0.281 J	0.236 J	0.164 J	0.141 J
	Calcium	N/A	1080	892	1090	1290	787	419 J
	Chromium (total)	5000 ugg	7.09	6.67	9.51	11.4	8.09	7.47
	Cobalt	N/A	3.71	3.49	4.51	5.44	4.52	3.30
	Copper	38000 ugg	5.82	5.98	6.91	7.09	6.65	5.94
	Iron	N/A	5300	5100	6600	7000	6900	5100
	Lead	500 ugg	2.07	2.53	3.03	2.70	2.13	2.15
	Magnesium	N/A	1170	1140	1620	1880	1560	1260
	Maghnanese	5100 ugg	58.6	61.5	95.5	116	110	50.7
	Nickel	700 ugg	9.22	8.91	9.94	11.4	9.96	8.07
TAL METAL	Potassium	N/A	744	701	1040	926	601	524
	Sodium	N/A	166 J	142 J	164 J	275	112 J	<200
	Vanadium	7200 ugg	7.02	6.32	9.51	9.70	7.42	6.05
	Zinc	5000 ugg	16.3	15.5	29.6	57.0	18.4	16.9
TCL BNA	1,6-Dimethylindan	N/A						
	2-Methylnapthalene	0.70 ugg	<0.330	<0.330	**10.0**	**2.90 J**	<0.330	<0.330
	4,6-Dimethylindan	N/A						
	Hexadecane	N/A						
	Pentadecane	N/A			3.00			
	Phenanthrene	700 ugg	<0.330	<0.330	<2.00	0.690	<0.330	<0.330
TCL Pest	DDE	9.0 ugg	<0.004	<0.004	<0.010	<0.004	<0.002	<0.004
	DDT	9.0 ugg	<0.004	<0.004	0.010 C	<0.004	<0.002	<0.004
TCL Pest	Heptachlor	0.70 ugg	<0.002	<0.002	0.012 U	<0.002	<0.001	<0.002
	alpha-Endosulfan	0.20 ugg	<0.002	<0.002	<0.005	<0.002	<0.001	<0.002
	beta-Benzenehexachloride	1.6 ugg	<0.002	<0.002	0.045 U	0.019 U	<0.001	<0.002
	delta-BHC	N/A	<0.002	<0.002	<0.005	<0.002	<0.001	<0.002
TCL VOA	1,2-Dimethylbenzene/ o-xylen	N/A	<0.005		0.041	<0.020	<0.005	<0.005

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 1 of 4

		Site ID	43BA93-01X	43BA93-01X	43BA93-01X	43BA93-01X	43BA93-02X	43BA93-02X
		Field Sample ID	BD430101	BX430101	BX430102	BX430103	BX430201	BX430202
		Sample Date	07/27/93	07/27/93	07/27/93	07/27/93	07/29/93	07/29/93
Test	Parameter	Screening Values	20.0 ft.	20.0 ft.	25.0 ft.	30.0 ft.	23.0 ft.	28.0 ft.
	1,3-and/or 1,4-Dimethylbenze	N/A	<0.005	<0.005	0.082	<0.020	<0.005	<0.005
	2,3,4-Triimethylpentane	N/A						
	2,4-Dimethylpentane	N/A						
	Carbon Disulfide	1000000 ugg	0.011 BJ	0.130 KJ	<0.005	<0.020	<0.005	<0.005
	Decane	N/A			0.710	0.170		
	Methylene chloride	0.10 ugg	0.009 B	0.009 BJ	0.016 B	<0.050	0.011 BJ	0.006 BJ
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	31.8	28.0	**21000**	820	20.6 J	152

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 2 of 4

		Site ID	43BA93-02X	43BA93-03X	43BA93-03X	43BA93-03X	43BA93-04X	43BA93-04X
		Field Sample ID	BX430203	BX430301	BX430302	BX430303	BX430401	BX430402
		Sample Date	07/29/93	07/29/93	07/29/93	07/29/93	07/28/93	07/28/93
Test	Parameter	Screening Values	33.0 ft.	23.0 ft.	28.0 ft.	33.0 ft.	23.0 ft.	28.0 ft.
TAL METAL	Aluminum	1000000 ugg	3000	2900	3600	2000	2900	2900
	Arsenic	30 ugg	8.22	10.9	11.8	9.36	15.0	11.0
	Barium	72000 ugg	12.2	12.6	22.2	9.10	8.91	9.83
	Beryllium	3.0 ugg	0.169 J	0.176 J	0.209 J	0.103 BJ	0.127 J	0.118 J
	Calcium	N/A	561 J	1720	538 J	690	319 J	478 J
	Chromium (total)	5000 ugg	8.02	8.76	11.4	2.88	7.66	8.49
	Cobalt	N/A	3.30	4.09	3.95	2.83	3.58	3.33
	Copper	38000 ugg	6.58	7.05	7.95	4.20	5.07	5.41
	Iron	N/A	5300	6200	7300	3800	5400	5300
	Lead	500 ugg	2.16	4.53	2.71	1.68	2.13	1.88
	Magnesium	N/A	1500	1380	2100	619 J	1460	1440
	Mangnese	5100 ugg	49.2	80.7	60.4	37.0	82.4	96.0
	Nickel	700 ugg	9.02	10.3	10.9	5.39	9.03	8.61
TAL METAL	Potassium	N/A	444	458	822	336	424	390
	Sodium	N/A	157 J	109 J	<200	122 J	<200	126 J
	Vanadium	7200 ugg	7.05	6.08	9.60	3.57	5.59	5.99
	Zinc	5000 ugg	51.1	25.7	22.2	16.7	19.5	15.1
TCL BNA	1,6-Dimethylindan	N/A				0.270		
	2-Methylnapthalene	0.70 ugg	**6.20**	<0.330	<0.330	<0.330	<0.330	<0.330
	4,6-Dimethylindan	N/A				0.210		
	Hexadecane	N/A		0.180				
	Pentadecane	N/A		0.230				
	Phenanthrene	700 ugg	2.00	<0.330	<0.330	<0.330	<0.330	<0.330
TCL Pest	DDE	9.0 ugg	<0.008	0.003 U	<0.002	<0.010	<0.004	<0.004
Test	Parameter	Screening Values	33.0 ft.	23.0 ft.	28.0 ft.	33.0 ft.	23.0 ft.	28.0 ft.
TCL Pest	DDT	9.0 ugg	<0.008	0.005 C	<0.002	<0.010	<0.004	<0.004
TCL Pest	Heptachlor	0.70 ugg	0.010 U	<0.001	<0.001	<0.005	<0.002	<0.002
	alpha-Endosulfan	0.20 ugg	<0.004	0.006 U	0.003 U	<0.005	<0.002	<0.002
	beta-Benzenehexachloride	1.6 ugg	0.040 U	<0.001	<0.001	<0.005	<0.002	<0.002
	delta-BHC	N/A	<0.004	<0.001	<0.001	<0.005	<0.002	<0.002
TCL VOA	1,2-Dimethylbenzene/ o-xylen	N/A	<0.020	<0.005	<0.005	<0.005	<0.002	<0.002

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 2 of 4

		Site ID	43BA93-02X	43BA93-03X	43BA93-03X	43BA93-03X	43BA93-04X	43BA93-04X
		Field Sample ID	BX430203	BX430301	BX430302	BX430303	BX430401	BX430402
		Sample Date	07/29/93	07/29/93	07/29/93	07/29/93	07/28/93	07/28/93
Test	Parameter	Screening Values	33.0 ft.	23.0 ft.	28.0 ft.	33.0 ft.	23.0 ft.	28.0 ft.
	1,3-and/or 1,4-dimethylbenze	N/A	0.150	<0.005	<0.005	<0.005	<0.005	<0.005
	2,3,4-Triimethylpentane	N/A	3.10					
	2,4-Dimethylpenthane	N/A	1.50					
	Carbon Disulfide	1000000 ugg	<0.020	<0.005	<0.005	0.014 B	<0.005	<0.005
TCL VOA	Decane	N/A						
	Methylene chloride	0.10 ugg	**0.200 B**	0.007 BJ	0.008 BJ	0.019 B	<0.010	<0.010
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	2900	46.9	16.8 J	138	21.3	20.4 J

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 3 of 4

		Site ID	43BA93-04X	43BA93-05X	43BA93-05X	43BA93-05X	43BA93-06X	43BA93-06X
		Field Sample ID	BX430403	BX430501	BX430502	BX430503	BX430601	BX430602
		Sample Date	07/28/93	07/28/93	07/28/93	07/28/93	07/28/93	07/28/93
Test	Parameter	Screening Values	33.0 ft.	23.0 ft.	28.0 ft.	33.0 ft.	23.0 ft.	28.0 ft.
TAL METAL	Aluminum	1000000 ugg	2900	2700	2900	3300	3500	3400
	Arsenic	30 ugg	12.1	11.3	11.0	10.1	13.0	12.9
	Barium	72000 ugg	14.2	8.81	11.3	10.1	10.3	9.58
	Beryllium	3.0 ugg	0.115 J	0.122 J	0.124 J	0.145 J	0.147 J	0.143 J
	Calcium	N/A	<500	445 J	2500	546 J	448 J	<500
	Chromium (total)	5000 ugg	8.80	7.05	8.29	9.87	11.2	8.71
	Cobalt	N/A	3.83	3.54	3.48	4.25	4.24	4.51
	Copper	38000 ugg	6.48	5.23	5.28	6.78	7.63	8.22
	Iron	N/A	5400	5000	5400	7100	8400	7600
	Lead	500 ugg	2.00	2.27	2.30	2.80	3.04	2.25
	Magnesium	N/A	1650	1320	1550	1860	1630	1870
	Manganese	5100 ugg	53.2	82.8	89.1	117	250	150
	Nickel	700 ugg	8.95	8.69	8.57	11.3	10.9	12.1
TAL METAL	Potassium	N/A	453	394	407	427	487	404
	Sodium	N/A	<200	97.8 J	92.5 J	<200	151 J	<200
	Vanadium	7200 ugg	6.49	5.59	6.88	7.33	7.70	7.07
	Zinc	5000 ugg	16.4	14.2	15.9	19.9	17.3	15.4
TCL BNA	1,6-Dimethylindan	N/A						
	2-Methylnapthalene	0.70 ugg	<0.330	<0.330	<0.330	<0.330	<0.330	<0.330
	4,6-Dimethylindan	N/A						
	Hexadecane	N/A						
	Pentadecane	N/A						
	Phenanthrene	700 ugg	<0.330	<0.330	<0.330	<0.330	<0.330	<0.330
TCL Pest	DDE	9.0 ugg	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004
	DDT	9.0 ugg	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004
TCL Pest	Heptachlor	0.70 ugg	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002
	alpha-Endosulfan	0.20 ugg	<0.002	<0.002	<0.002	<0.002	<0.004	0.004 U
	beta-Benzenehexachloride	1.6 ugg	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002
	delta-BHC	N/A	<0.002	<0.002	<0.002	0.005 U	<0.004	<0.002
TCL VOA	1,2-Dimethylbenzene/ o-xylen	N/A	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	1,3-and/or 1,4-Dimethylbenze	N/A	0.008	<0.005	<0.005	<0.005	<0.005	<0.005

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 3 of 4

		Site ID	43BA93-04X	43BA93-05X	43BA93-05X	43BA93-05X	43BA93-06X	43BA93-06X
		Field Sample ID	BX430403	BX430501	BX430502	BX430503	BX430601	BX430602
		Sample Date	07/28/93	07/28/93	07/28/93	07/28/93	07/28/93	07/28/93
Test	Parameter	Screening Values	33.0 ft.	23.0 ft.	28.0 ft.	33.0 ft.	23.0 ft.	28.0 ft.
	2,3,4-Triimethylpentane	N/A						
	2,4-Dimethylpentane	N/A						
	Carbon Disulfide	1000000 ugg	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Decane	N/A						
	Methylene chloride	0.10 ugg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TOC	Total Organic Carbon	N/A						
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	23.7 J	22.8	18.0 J	<20.0	<20.0	16.7 J

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 4 of 4

		Site ID	43MA93-06X	43MA93-04X	43MA93-06X	43MA93-07X	43MA93-08X	
		Field Sample ID	BX430603	BX4304X1	BX4306X1	BX4307X1	BX4308X1	
		Sample Date	07/28/93	07/27/93	07/28/93	07/30/93	07/27/93	
Test	Parameter	Screening Values	33.0 ft.	29.0 ft.	29.0 ft.	24.0 ft.	29.0 ft.	
TAL METAL	Aluminum	1000000 ugg	5100					
	Arsenic	30 ugg	**33.0**					
	Barium	72000 ugg	18.8					
	Beryllium	3.0 ugg	0.274 J					
	Calcium	N/A	838					
	Chromium (total)	5000 ugg	25.8					
	Cobalt	N/A	6.56					
	Copper	38000 ugg	11.8					
	Iron	N/A	14000					
	Lead	500 ugg	3.98					
	Magnesium	N/A	3500					
	Manganese	5100 ugg	340					
	Nickel	700 ugg	19.9					
TAL METAL	Potassium	N/A	701					
	Sodium	N/A	<200					
	Vanadium	7200 ugg	**14.3**					
	Zinc	5000 ugg	26.5					
TCL BNA	1,6-Dimethylindan	N/A						
	2-Methylnapthalene	0.70 ugg	<0.330					
	4,6-Dimethylindan	N/A						
	Hexadecane	N/A						
	Pentadecane	N/A						
	Phenanthrene	700 ugg	<0.330					
TCL Pest	DDE	9.0 ugg	<0.004					
	DDT	9.0 ugg	<0.004					
TCL Pest	Heptachlor	0.70 ugg	<0.002					
	alpha-endosulfan	0.20 ugg	0.004 UJ					
	beta-Benzenehexachloridfe	1.6 ugg	<0.002					
	delta-BHC	N/A	<0.002					

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSO
Site Type: BORE

Table 5
Chemical Summary Report For Subsurface Soils
Area of Contamination: 43A
Units: UGG

Part 4 of 4

		Site ID	43MA93-06X	43MA93-04X	43MA93-06X	43MA93-07X	43MA93-08X	
		Field Sample ID	BX430603	BX4304X1	BX4306X1	BX4307X1	BX4308X1	
		Sample Date	07/28/93	07/27/93	07/28/93	07/30/93	07/27/93	
Test	Parameter	Screening Values	33.0 ft.	29.0 ft.	29.0 ft.	24.0 ft.	29.0 ft.	
TCL VOA	1,2-Dimethylbenzene/ o-xylen	N/A	<0.005					
	1,3-and/or 1,4-Dimethylbenze	N/A	0.005					
	2,4-Dimethylpentane	N/A						
	Carbon Disulfide	1000000 ugg	<0.005					
	Decane	N/A						
	Methylene chloride	0.10 ugg	<0.010					
TOC	Total Organic Carbon	N/A		10700	8880	10300	12800	
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	13.3 J					

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 1 of 7

		Site ID	32M-92-01X	32M-92-01X	32M-92-01X	32M-92-02X	32M-92-02X	32M-92-02X
		Field Sample ID	MX3201X1	MX3201X2	MX3201X3	MX3202X1	MX3202X2	MX3202X3
		Sample Date	11/19/92	03/03/93	06/22/93	11/19/92	03/03/93	06/22/93
Test	Parameter	Screening Values						
EXPLOSIVES	2-Nitrotoluene	N/A			<1.00			<1.00
TCL BNA	1,2,4-Trichlorobenzene	70 ugl	<1.80	<1.80		<1.80	<1.80	
	1,2-Dichlorobenzene	600 ugl	<1.70	<1.70		<1.70	<1.70	
	1,3-Dichlorobenzene	600 ugl	<1.70	<1.70		<1.70	<1.70	
	1,4-Dichlorobenzene	5.0 ugl	<1.70	<1.70		<1.70	<1.70	
	1-Methylnaphthalene	N/A						
	2-Ethyl-1-hexanol	N/A		5.00				
	2-Methylnapthalene	10 ugl	<1.70	<1.70		<1.70	<1.70	
	3-Methylundecane	N/A						
TCL BNA	6-Aminohexanoic acid lactam	N/A						
	Bis(2-ethylhexyl) phthalate	6.0 ugl	**8.50**	<4.80		<4.80	<4.80	
	Cyclohexene Oxide	N/A	4.00	5.00				
	Dodecanoic Acid/Lauric Aci	N/A					20.0	
	Decane	N/A						
	Di-n-butyl-phthalate	N/A	<3.70	<3.70		<3.70	<3.70	
	Hendecane/ Undecane	N/A						
	Hexacosane	N/A						
	Napthalene	20 ugl	<0.500	<0.500		<0.500	<0.500	
	Pentacosane	N/A						
TCL BNA	Phenanthrene	300 ugl	<0.500	<0.500		<0.500	<0.500	
	Tetradecane	N/A						
	Tridecane	N/A						
TCL Pest	DDD	0.10 ugl	<0.023	<0.023		<0.023	<0.023	
	DDT	0.30 ugl	<0.034	<0.034		<0.034	<0.034	
	PCB1260	0.50 ugl	<0.190	<0.190		<0.190	<0.190	

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 1 of 7

		Site ID	32M-92-01X	32M-92-01X	32M-92-01X	32M-92-02X	32M-92-02X	32M-92-02X
		Field Sample ID	MX3201X1	MX3201X2	MX3201X3	MX3202X1	MX3202X2	MX3202X3
		Sample Date	11/19/92	03/03/93	06/22/93	11/19/92	03/03/93	06/22/93
TCL VOA	1,1,1-Trichloroethane	200 ugl	0.550	<0.500		<0.500	<0.500	
	1,1,2-Trichloro-1,2,2-Trifluore	N/A						
	1,2-Dichloroethane	5.0 ugl	<0.500	0.770		<0.500	0.620	
	Acetone	3000 ugl	<13.0	<13.0		<13.0	<13.0	
	Benzene	5.0 ugl	<0.500	<0.500		<0.500	<0.500	
TCL VOA	Chloroform	5.0 ugl	<0.500	<0.500		<0.500	<0.500	
	Dichlorobenzenes	N/A	<10.0	<10.0		<10.0	<10.0	
	Ethylbenzene	700 ugl	<0.500	<0.500		<0.500	<0.500	
	Methylene chloride	5.0 ugl	<2.30	<2.30		<2.30	<2.30	
	Toluene	1000 ugl	<0.500	<0.500		<0.500	<0.560	
	Total-1,2-dichloroethene	N/A	<0.500	<05.00		<0.500	<0.500	
	Trichloroethylene (TCE)	5.0 ugl	<0.500	<0.500		2.90	<0.500	
	Xylene	N/A	<0.840	<0.840		<0.840	<0.840	
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	<199	<193		<190	<175	
WQP	Hardness	N/A	1600	135000	120000	74800	76000	67000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 2 of 7

		Site ID	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-04X
		Field Sample ID	MD3203X1	MD3203X3	MX3203X1	MD3203X2	MX3203X3	MR3202X2
		Sample Date	11/19/92	06/22/93	11/19/92	03/04/93	06/22/93	03/04/93
Test	Parameter	Screening Values						
EXPLOSIVES	2-Nitrotoluene	N/A		<1.00			<1.00	
TCL BNA	1,2,4-Trichlorobenzene	70 ugl	<1.80		<1.80	<1.80		
	1,2-Dichlorobenzene	600 ugl	<1.70		<1.70	<1.70		
	1,3-Dichlorobenzene	60 ugl	<1.70		<1.70	<1.70		
	1,4-Dichlorobenzene	5.0 ugl	<1.70		<1.70	<1.70		
	1-Methylnaphthalene	N/A						
	2-Ethyl-1-hexanol	N/A						
	2-Methylnapthalene	10 ugl	<1.70		<1.70	<1.70		
	3-Methylundecane	N/A						
TCL BNA	6-Aminonhexanoic acid lactam	N/A						
	Bis(2-ethylhexyl) phthalate	6.0 ugl	<4.80		<4.80	<4.80		
	Cyclohexene Oxide	N/A						
	Dodecanio Acid/Lauric Aci	N/A						
	Decane	N/A						
	Di-n-butyl-phthalate	N/A	<3.70		<3.70	<3.70		
	Hendecane/Undecane	N/A						
	Hexacosane	N/A						
	Napthalene	20 ugl	<0.500		<0.500	<0.500		
	Pentacosane	N/A						
	Phenanthrene	300 ugl	<0.500		<0.500	<0.500		
	Tetracosane	N/A						
TCL Pest	Tetradecane	N/A						
	Tridecane	N/A						
	DDD	0.10 ugl	<0.023		<0.023	<0.023		
	DDT	0.30 ugl	<0.034		<0.034	<0.034		
	PCB1260	0.50 ugl	<0.190		<0.190	<0.190		

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 2 of 7

		Site ID	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-04X
		Field Sample ID	MD3203X1	MD3203X3	MX3203X1	MD3203X2	MX3203X3	MR3202X2
		Sample Date	11/19/92	06/22/93	11/19/92	03/04/93	06/22/93	03/04/93
Test	Parameter	Screening Values						
TCL VOA	1,1,1-Trichloroethane	200 ugl	<0.500		<0.500	<0.500		<0.500
	1,1,2-Trichloro- 1,2,2-Trifluore	N/A						
	1,2-Dichloroethane	5.0 ugl	<0.500		<0.500	<0.500		<0.500
	Acetone	3000 ugl	52.0		51.0	<13.0		<13.0
	Benzene	5.0 ugl	<0.500		<0.500	<0.500		<0.500
	Chloroform	5.0 ugl	0.610		0.730	<0.500		**31.0**
	Dichlorobenzenes	N/A	<10.0		<10.0	<10.0		<10.0
TCL VOA	Ethylbenzene	700 ugl	<0.500		<0.500	<0.500		<0.500
	Methylene chloride	5.0 ugl	<2.30 B		<2.30	<2.30		**61.0**
	Toluene	1000 ugl	0.980		0.900	0.700		<0.500
	Total-1,2-dichloroethene	N/A	<0.500		<0.500	<0.500		<0.500
	Trichloroethylene (TCE)	5.0 ugl	<0.500		<0.500	<0.500		<0.500
	Xylene	N/A	<0.840		<0.840	<0.840		<0.840
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	<190		<188	<191		
WQP	Hardness	N/A	58800	44000	49600	57200	47000	<1000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 3 of 7

		Site ID	32M-92-04X	32M-92-04X	32M-92-04X	32M-92-05X	32M-92-05X	32M-92-05X
		Field Sample ID	MX3204X1	MX3204X2	MX3204X3	MX3205X1	MX3205X2	MX3205X3
		Sample Date	11/20/92	03/04/93	06/22/93	11/19/92	03/04/93	06/22/93
Test	Parameter	Screening Values						
EXPLOSIVES	2-Nitrotoluene	N/A						<1.00
TCL BNA	1,2,4-Trichlorobenzene	70 ugl	40.0	<9.00			<1.80	
	1,2-Dichlorobenzene	600 ugl	**6000**	200			<1.70	
	1,3-Dichlorobenzene	600 ugl	**1000**	60.0			<1.70	
	1,4-Dichlorobenzene	5.0 ugl	**600**	**40.0**			<1.70	
	1-Methylnaphthalene	N/A						
	2-Ethyl-1-hexanol	N/A						
	2-Methylnapthalene	10 ugl	**40.0**	<8.00			<1.70	
	3-Methylnapthalene	N/A	100					
TCL BNA	6-Aminohexanoic acid lactam	N/A						
	Bis(2-ethylhexyl) phthalate	6.0 ugl	<20.0	**40.0**			<4.80	
	Cyclohexene Oxide	N/A						
	Dodecanoic Acid/ Lauric Aci	N/A						
	Decane	N/A	50.0					
	Di-n-butyl-phthalate	N/A	<20.0	<20.0			<3.70	
	Hendecane/Undecane	N/A		100				
	Hexacosane	N/A						
	Napthalene	20 ugl	9.00	<2.00			<0.500	
	Pentacosane	N/A					7.00	
	Phenanthrene	300 ugl	20.0	5.00			<0.500	
	Tetracosane	N/A					8.00	
TCL BNA	Tetradecane	N/A	500	200				
	Tridecane	N/A	300					
TCL Pest	DDD	0.10 ugl	**0.385 C**	<0.023			<0.023	
	DDT	0.30 ugl	**4.00 C**	<0.034			<0.034	

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 3 of 7

		Site ID	32M-92-04X	32M-92-04X	32M-92-04X	32M-92-05X	32M-92-05X	32M-92-05X
		Field Sample ID	MX3204X1	MX3204X2	MX3204X3	MX3205X1	MX3205X2	MX3205X3
		Sample Date	11/20/92	03/04/93	06/22/93	11/19/92	03/04/93	06/22/93
Test	Parameter	Screening Values						
	PCB1260	0.50 ugl	**6.56 C**	**7.60 C**		<0.190	<0.190	
TCL VOA	1,1,1-Trichloroethane	200 ugl	60.0	<0.500		<0.500	1.20	
	1,1,2-Trichloro-1,2,2-Trifluore	N/A						
	1,2-Dichloroethane	5.0 ugl	<50.0	1.10		<0.500	1.80	
	Acetone	3000 ugl	<1000	<13.0		<13.0	<13.0	
	Benzene	5.0 ugl	<50.0	<0.500		<0.500	<0.500	
	Chloroform	5.0 ugl	<50.0	<0.500		1.30	<0.500	
TCL BNA	Dichlorobenzenes	N/A	8000	270		<10.0	<10.0	
	Ethylbenzene	700 ugl	<50.0	<0.500		<0.500	<0.500	
TCL VOA	Methylene chloride	5.0 ugl	**400 B**	<2.30		<2.30	<2.30	
	Toluene	1000 ugl	<50.0	<0.500		3.60	<0.500	
	Total-1,2-dichloroethene	N/A	<50.0	<0.500		<0.500	<0.500	
	Trichloroethylene (TCE)	5.0 ugl	<50.0	1.70		<0.500	<0.500	
	Xylene	N/A	<80.0	<0.840		<0.840	<0.840	
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	**960000**	**360000**			504	
WQP	Hardness	N/A	16000	18800	17000	17000	74800	100000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 4 of 7

		Site ID	32M-92-06X	32M-92-06X	32M-92-06X	32M-92-07X	32M-92-07X	32M-92-07X
		Field Sample ID	MX3206X1	MX3206X2	MX3206X3	MD3207X2	MX3207X1	MX3207X2
		Sample Date	11/19/92	03/04/93	06/22/93	03/04/93	11/19/92	03/04/93
Test	Parameter	Screening Values						
EXPLOSIVES	2-Nitrotoluene	N/A			<1.00 J			
TCL BNA	1,2,4-Trichlorobenzene	70 ugl	<1.80	<1.80		<1.80	<1.80	<1.80
	1,2-Dichlorobenzene	600 ugl	**1000**	**700**		<1.70	<1.70	<1.70
	1,3-Dichlorobenzene	600 ugl	190	110		<1.70	<1.70	<1.70
	1,4-Dichlorobenzene	5.0 ugl	**120**	**70.0**		<1.70	<1.70	<1.70
	1-Methylnaphthalene	N/A	8.00					
	2-Ethyl-1-hexanol	N/A						
	2-Methylnapthalene	10 ugl	7.60	<1.70		<1.70	<1.70	<1.70
	3-Methylundecane	N/A						
TCL BNA	6-Aminohexanoic acid lactam	N/A		100		70.0		70.0
	Bis(2-ethylhexy) phthalate	6.0 ugl	<4.80	<4.80		<4.80	<4.80	<4.80
	Cyclohexene Oxide	N/A						
	Dodecanoic Acid Lauric Aci	N/A						
	Decane	N/A						
	Di-n-butyl-phthalate	N/A	<3.70	3.70		<3.70	<3.70	<3.70
	Hendecane/Undecane	N/A						
	Hexacosane	N/A					5.00	
	Napthalene	20 ugl	4.50	1.60		<0.500	<0.500	<0.500
	Pentacosane	N/A					6.00	
	Phenanthrene	300 ugl	1.20	<0.500		<0.500	<0.500	<0.500
	Tetracosane	N/A					7.00	
TCL BNA	Tetradecane	N/A						
	Tridecane	N/A						
TCL Pest	DDD	0.10 ugl	<0.023	<0.023		<0.023	<0.023	<0.023
	DDT	0.30 ugl	<0.034	<0.034		<0.034	<0.034	<0.034
	PCB1260	0.50 ugl	<0.190	<0.190		<0.190	<0.190	<0.190

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 4 of 7

		Site ID	32M-92-06X	32M-92-06X	32M-92-06X	32M-92-07X	32M-92-07X	32M-92-07X
		Field Sample ID	MX3206X1	MX3206X2	MX3206X3	MD3207X2	MX3207X1	MX3207X2
		Sample Date	11/19/92	03/04/93	06/22/93	03/04/93	11/19/92	03/04/93
Test	Parameter	Screening Values						
TCL VOA	1,1,1-Trichloroethane	200 ugl	8.00 K	5.10		<0.500	0.970	<0.500
	1,1,2-Trichloro- 1,2,2-Trifluore	N/A	20.0					
	1,2-Dichloroethane	5.0 ugl	<1.00	<0.500		<0.500	<0.500	<0.500
	Acetone	3000 ugl	<30.0	<13.0		<13.0	<13.0	<13.0
	Benzene	5.0 ugl	4.00	0.600		<0.500	<0.500	<0.500
	Chloroform	5.0 ugl	1.00	<0.500		<0.500	<0.500	<0.500
TCL VOA	Dichlorobenzenes	N/A	2000	1400		<10.0	<10.0	<10.0
	Ethylbenzene	700 ugl	4.00	1.80		<0.500	<0.500	<0.500
	Methylene chloride	5.0 ugl	<5.00	<2.30		<2.30	<2.30	<2.30
	Toluene	1000 ugl	<1.00	<0.500		<0.500	<0.500	<0.500
	Total-1,2-dichloroethene	N/A	60.0	24.0		<0.500	<0.500	<0.500
	Trichloroethylene (TCE)	5.0 ugl	**200**	**140**		<0.500	<0.500	<0.500
	Xylene	N/A	10.0	9.40		<0.840	<0.840	<0.840
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	**18500**	669		<184	<180	<202
WQP	Hardness	N/A	87000	35200	25000	17200	23600	16000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 5 of 7

		Site ID	32M-92-07X	POL-1	POL-1	POL-1	POL-3	POL-3
		Field Sample ID	MX3207X3	MX3208X1	MX3208X2	MX3208X3	MX3210X1	MX3210X2
		Sample Date	06/22/93	11/20/92	03/04/93	06/21/93	11/20/92	03/04/93
Test	Parameter	Screening Values						
EXPLOSIVES	2-Nitrotoluene	N/A	<1.00			<1.00		
TCL BNA	1,2,4-Trichlorobenzene	70 ugl		<1.80	<1.80		<1.80	<1.80
	1,2-Dichlorobenzene	600 ugl		<1.70	<1.70		<1.70	<1.70
	1,3-Dichlorobenzene	600 ugl		<1.70	<1.70		<1.70	<1.70
	1,4-Dichlorobenzene	5.0 ugl		<1.70	<1.70		<1.70	<1.70
	1-Methylnaphthalene	N/A						
	2-Ethyl-1-hexanol	N/A						
	2-Methylundecane	10 ugl		<1.70	<1.70		<1.70	<1.70
	3-Methylundecane	N/A						
	6-Aminohexanoic acid lactam	N/A		60.0	5.00			20.0
TCL BNA	Bis(2-ethylhexyl) phthalate	6.0 ugl		<4.80	<4.80		<4.80	<4.80
	Cyclohexene Oxide	N/A						
	Dodecanoic Acid/ Lauric Aci	N/A						
	Decane	N/A						
	Di-n-butyl-phthalate	N/A		4.00	<3.70		<3.70	<3.70
	Hendecane/Undecane	N/A						
	Hexacosane	N/A						
	Napthalene	20 ugl		<0.500	<0.500		<0.500	<0.500
	Pentacosane	N/A						
	Phenanthrene	300 ugl		<0.500	<0.500		<0.500	<0.500
	Tetracosane	N/A						
	Tetradecane	N/A						
TCL BNA	Tridecane	N/A						
TCL Pest	DDD	0.10 ugl		<0.023	<0.023		<0.023	<0.023
	DDT	0.30 ugl		<0.034	<0.034		<0.034	<0.034
	PCB1260	0.50 ugl		<0.190	<0.190		<0.190	<0.190

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 5 of 7

		Site ID	32M-92-07X	POL-1	POL-1	POL-1	POL-3	POL-3
		Field Sample ID	MX3207X3	MX3208X1	MX3208X2	MX3208X3	MX3210X1	MX3210X2
		Sample Date	06/22/93	11/20/92	03/04/93	06/21/93	11/20/92	03/04/93
Test	Parameter	Screening Values						
TCL VOA	1,1,1-Trichloroethane	200 ugl		<0.500	<0.500		<0.500	<0.500
	1,1,2-Trichloro-1,2,2-Trifluore	N/A						
	1,2-Dichloroethane	5.0 ugl		<0.500	<0.500		<0.500	<0.790
	Acetone	3000 ugl		<13.0	<13.0		<13.0	<13.0
	Benzene	5.0 ugl		<0.500	<0.500		<0.500	<0.500
	Chloroform	5.0 ugl		<0.500	<0.500		0.730	<0.500
	Dichlorobenzenes	N/A		<10.0	<10.0		<10.0	<10.0
TCL VOA	Ethylbenzene	700 ugl		<0.500	<0.500		<0.500	<0.500
	Methylene chloride	5.0 ugl		<2.30	<2.30		<2.30	<2.30
	Toluene	1000 ugl		<0.500	<0.500		<0.500	<0.500
	Total-1,2-dichloroethene	N/A		<0.500	<0.500		<0.500	<0.500
	Trichloroethylene (TCE)	5.0 ugl		0.730	<0.500		**19.0**	**17.0**
	Xylene	N/A		<0.840	<0.840		<0.840	<0.840
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl		<1710	<202		<1710	<207
WQP	Hardness	N/A	13000	62600	57200	67000	113000	126000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 6 of 7

		Site ID	POL-3	SHL-15	SHL-15	SHL-15	SHL-15	SHL-25
		Field Sample ID	MX3210X3	MX3212X3	MX3212X2	MX3212X2	MX3212X3	MF3211X3
		Sample Date	06/21/93	07/14/93	03/04/93	06/21/93	07/14/93	07/14/93
Test	Parameter	Screening Values						
EXPLOSIVES	2-Nitrotoluene	N/A	<1.00			<1.00		
TCL BNA	1,2,4-Trichlorobenzene	70 ugl			<1.80			
	12-Dichlorobenzene	600 ugl			<1.70			
	1,3-Dichlorobenzene	600 ugl			<1.70			
	1,4-Dichlorobenzene	5.0 ugl			<1.70			
	1-Methylnaphthalene	N/A						
	2-Ethyl-l-hexanol	N/A						
	2-Methylnapthalene	10 ugl			<1.70			
	3-Methylundecane	N/A						
TCL BNA	6-Aminohexanoic acid lactam	N/A						
	Bis(2-ethylhexyl) phthalate	6.0 ugl			<4.80			
	Cyclohexene Oxide	N/A						
	Dodecanoic Acid/ Lauri Aci	N/A						
	Decane	N/A						
	Di-n-butyl-phthalate	N/A			<3.70			
	Hendecane/Undecane	N/A						
	Hexacosane	N/A						
	Napthalene	20 ugl			<0.500			
	Pentacosane	N/A						
	Phenanthrene	300 ugl			<0.500			
	Tetracosane	N/A						
TCL BNA	Tetradecane	N/A						
	Tridecane	N/A						
TCL Pest	DDD	0.10 ugl			<0.023			
	DDT	0.30 ugl			<0.034			
	PCB1260	0.50 ugl			<0.190			

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW Site Type: WELL	Table 6 Chemical Summary Report For Organics and Water Quality Parameters in Groundwater Area of Contamination: 32 Units: UGL						Part 6 of 7	
		Site ID	POL-3	SHL-15	SHL-15	SHL-15	SHL-15	SHL-25
		Field Sample ID	MX3210X3	MX3212X3	MX3212X2	MX3212X2	MX3212X3	MF3211X3
		Sample Date	06/21/93	07/14/93	03/04/93	06/21/93	07/14/93	07/14/93
Test	Parameter	Screening Values						
TCL VOA	1,1,1-Trichloroethane	200 ugl			<0.500			
	1,1,2-Trichloro- 1,2,2-Trifluore	N/A						
	1,2-Dichloroethane	5.0 ugl			<0.500			
	Acetone	3000 ugl			<13.0			
	Benzene	5.0 ugl			<0.500			
	Chloroform	5.0 ugl			<0.500			
TCL VOA	Dichlorobenzenes	N/A			<10.0			
	Ethylbenzene	700 ugl			<0.500			
	Methylene chloride	5.0 ugl			<2.30			
	Toluene	1000 ugl			<0.500			
	Total-1,2-dichloroethene	N/A			<0.500			
	Trichloroethylene (TCE)	5.0 ugl			<0.500			
	Xylene	N/A			<0.840			
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl			<202			
WQP	Hardness	N/A	110000	70000	41200		69000	47000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 7 of 7

		Site ID	SHL-25	SHL-25	SHL-25	SHL-25		
		Field Sample ID	MX3211X1	MX3211X2	MX3211X3	MX3211X3		
		Sample Date	11/20/92	03/04/93	06/21/93	07/14/93		
Test	Parameter	Screening Values						
EXPLOSIVES	2-Nitrotoluene	N/A			3.00 JU			
TCL BNA	1,2,4-Trichlorobenzene	70 ugl	<1.80	<1.80				
	1,2-Dichlorobenzene	600 ugl	<1.70	<1.70				
	1,3-Dichlorobenzene	600 ugl	<1.70	<1.70				
	1,4-Dichlorobenzene	5.0 ugl	<1.70	<1.70				
	1-Methylnapthalene	N/A						
	2-Ethyl-1-hexanol	N/A						
	2-Methylnapthalene	10 ugl	<1.70	<1.70				
	3-Methylundecane	N/A						
TCL BNA	6-Aminohexanoic acid lactam	N/A						
	Bis(2-ethylhexyl) phthalate	6.0 ugl	<4.80	<4.80				
	Cyclohexene Oxide	N/A						
	Dodecanoic Acid/ Lauri Aci	N/A						
	Decane	N/A						
	Di-n-butyl-phthalate	N/A	<3.70	<3.70				
	Hendecane/Undecane	N/A						
	Hexacosane	N/A						
	Napthalene	20 ugl	<0.500	<0.500				
	Pentacosane	N/A						
	Phenanthrene	300 ugl	<0.500	<0.500				
	Tetracosane	N/A						
TCL Pest	Tetradecane	N/A						
	Tridecane	N/A						
	DDD	0.10 ugl	<0.023	<0.023				
	DDT	0.30 ugl	<0.034	<0.034				

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 6
Chemical Summary Report For Organics and
Water Quality Parameters in Groundwater
Area of Contamination: 32
Units: UGL

Part 7 of 7

		Site ID	SHL-25	SHL-25	SHL-25	SHL-25		
		Field Sample ID	MX3211X1	MX3211X2	MX3211X3	MX3211X3		
		Sample Date	11/20/92	03/04/93	06/21/93	07/14/93		
Test	Parameter	Screening Values						
	PCB1260	0.50 ugl	<0.190	<0.190				
TCL VOA	1,1,1-Trichloroethane	200 ugl	<0.500	<0.500				
	1,1,2-Trichloro-1,2,2-Trifluore	N/A						
	1,2-Dichloroethane	5.0 ugl	<0.500	<0.500				
	Acetone	3000 ugl	<13.0	<13.0				
	Benzene	5.0 ugl	<0.500	<0.500				
	Chloroform	5.0 ugl	<0.500	<0.500				
	Dichlorobenzenes	N/A	<10.0	<10.0				
TCL VOA	Ethylbenzene	700 ugl	<0.500	<0.500				
	Methylene chloride	5.0 ugl	<2.30	<2.30				
	Toluene	1000 ugl	0.520	<0.500				
	Total-1,2-dichloroethene	N/A	<0.500	<0.500				
	Trichloroethylene (TCE)	5.0 ugl	1.10	<0.500				
	Xylene	N/A	<0.840	<0.840				
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	<1710	<188				
WQP	Hardness	N/A	33000	32200		46000		

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (see key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 1 of 9

		Site ID	32M-92-01X	32M-92-01X	32M-92-01X	32M-92-01X	32M-92-02X	32M-92-02X
		Field Sample ID	MF3201X3	MX3201X1	MX3201X2	MX3201X3	MF3202X3	MX3202X1
		Sample Date	06/22/93	11/19/92	03/03/93	06/22/93	06/22/93	11/19/92
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	<25.0	**475**	**2680 J**	**330 J**	35.8	**11500**
	Arsenic	50 ugl	3.42	3.94	23.6	6.12	<2.00	44.1
	Barium	2000 ugl	16.9	19.0	32.3	19.6	36.4	95.4
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	40300	42600	48300	41000	24200	24900
	Chromium (total)	100 ugl	<10.0	<6.02	<6.02	<10.0	<10.0	15.9
	Cobalt	N/A	<10.0	<25.0	<25.0	<10.0	<10.0	<25.0
	Copper	1000 ugl	<10.0	<8.09	<8.09	<10.0	<10.0	15.6 B
	Iron	300 ugl	84.0	**1270**	**4210**	**744**	<25.0	**14800**
	Lead	15 ugl	<5.00	2.71	2.49	<5.00	<5.00	12.5
	Magnesium	N/A	4390	4370	5490	4480	3110	4980
	Manganese	50 ugl	**7000**	**6450**	**7930**	**7100**	28.6	**756**
	Nickel	100 ugl	<10.0	<34.3	<34.3	<10.0	12.8	56.0
	Potassium	N/A	6780	6360	8250	6160	1680	5510
TAL METAL	Silver	40 ugl	3.71	<4.60	<4.60	3.43	<2.00	<4.60
	Sodium	N/A	14400	10300	13100	14800	9350	10400
	Vanadium	N/A	<10.0	<11.0	<11.0	<10.0	<10.0	15.4
	Zinc	2000 ugl	<20.0	<21.1	<21.1	72.0 BJ	31.5	74.8

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 2 of 9

		Site ID	32M-92-02X	32M-92-02X	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-03X
		Field Sample ID	MX3202X2	MX3202X3	MD3203X1	MD3203X3	MF3203D3	MF3203X2
		Sample Date	03/03/93	06/22/93	11/19/92	06/22/93	06/22/93	03/04/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**1900 J**	**121 J**	**9740**	**11000**	**54.4**	<141
	Arsenic	50 ugl	5.54	<2.00	26.9	9.64	<2.00	2.98
	Barium	2000 ugl	51.3	31.3	61.7	32.7	20.0	9.35
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	30000	22100	17800	14300	15900	15900
	Chromium (total)	100 ugl	<6.02	<10.0	16.0	<10.0	<10.0	<6.02
	Cobalt	N/A	<25.0	<10.0	<25.0	<10.0	<10.0	<25.0
	Copper	1000 ugl	<8.09	<10.0	12.8 B	<10.0	<10.0	<8.09
	Iron	300 ugl	**2330**	137	**13900**	**3800**	<25.0	239 B
	Lead	15 ugl	4.23	<5.00	**21.3**	5.06	>5.00	<1.26
	Magnesium	N/A	3590	2930	3170	2020	1870	1730
	Manganese	50 ugl	**139**	29.7	**1310**	**929**	**894**	**1880**
	Nickel	100 ugl	<34.3	<10.0	<34.3	<10.0	<10.0	<34.3
	Potassium	N/A	2290 B	2200	6330	2640	2350	3210
TAL METAL	Silver	40 ugl	<4.60	<2.00	<4.60	<2.00	<2.00	<4.60
	Sodium	N/A	10500	10200	33000	23300	24400	32400
	Vanadium	N/A	<11.0	<10.0	18.5	<10.0	<10.0	<11.0
	Zinc	2000 ugl	46.2	16.7 BJ	48.0	72.9 B	<20.0	<21.1

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 3 of 9

		Site ID	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-03X	32M-92-04X	32M-92-04X
		Field Sample ID	MF3203X3	MX3203X1	MX3203X2	MX3203X3	MF3204X3	MX3204X1
		Sample Date	06/22/93	11/19/92	03/04/93	06/22/93	06/23/93	11/20/92
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**52.0**	**8440**	**17600 J**	**2100 J**	<25.0	**971**
	Arsenic	50 ugl	<2.00	22.0	48.6	6.79	<2.00	3.62
	Barium	2000 ugl	19.5	54.3	112	34.7	<10.0	18.1
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	0.338 J	<5.00	<5.00
	Calcium	N/A	16000	17700	21100	15000	4970	5330
	Chromium (total)	100 ugl	<10.0	15.5	35.7	7.36 J	<10.0	<6.02
	Cobalt	N/A	<10.0	<25.0	35.5	<10.0	<10.0	<25.0
	Copper	1000 ugl	<10.0	11.9 B	37.0	6.29 J	<10.0	<8.09
	Iron	300 ugl	<25.0	**12800**	**24900**	**3400**	67.3	**746**
	Lead	15 ugl	<5.00	13.3	**20.4**	5.37	<5.00	**30.2**
	Magnesium	N/A	3110	3000	4910	2190	<500	516
	Manganese	50 ugl	**899**	**1260**	**2470**	**1000**	11.9 K	**561**
	Nickel	100 ugl	<10.0	<34.3	<34.3	11.2	<10.0	<34.3
	Potassium	N/A	2290	5800	8880	3070	<1000	1330
TAL METAL	Silver	40 ugl	<2.00	<4.60	<4.60	<2.00	<2.00	<4.60
	Sodium	N/A	24800	34000	33500	26800	<2000	1620
	Vanadium	N/A	<10.0	15.6	30.4	3.05 J	<10.0	<11.0
	Zinc	2000 ugl	<20.0	43.6	96.0	30.2 BJ	<20.0 K	<21.1

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 4 of 9

		Site ID	32M-92-04X	32M-92-04X	32M-92-05X	32M-92-05X	32M-92-05X	32M-92-06X
		Field Sample ID	MX3204X2	MX3204X3	MF3205X3	MX3205X2	MX3205X3	MF3206X3
		Sample Date	03/04/93	06/22/93	06/22/93	03/04/93	06/22/93	06/22/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**203 J**	**391 J**	35.9	**1030 J**	**1900 J**	<25.0
	Arsenic	50 ugl	<2.54	3.32	<2.00	<2.54	3.55	**55.8**
	Barium	2000 ugl	18.8	31.4	21.2	18.1	35.4	25.4
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	6450	5680	39300	27800	38300	8480
	Chromium (total)	100 ugl	<6.02	<10.0	<10.0	<6.02	<10.0	<10.0
	Cobalt	N/A	<25.0	<10.0	<10.0	<25.0	<10.0	<10.0
	Copper	1000 ugl	9.44	<10.0	<10.0	9.99	10.9	<10.0
	Iron	300 ugl	141 B	**368**	30.2	**1350**	**3800**	**2800**
	Lead	15 ugl	9.98	**21.4**	<5.00	10.4	6.74	<5.00
	Magnesium	N/A	639	552	1550	1170	1880	1070
	Manganese	50 ugl	**141**	**216**	11.1	**177**	**580**	**3600**
	Nickel	100 ugl	<34.3	<10.0	<10.0	<34.3	<10.0	<10.0
	Potassium	N/A	988	<1000	2300	2510	3010	2830
TAL METAL	Silver	40 ugl	<4.60	<2.00	<2.00	<4.60	<2.00	<2.00
	Sodium	N/A	1940	2020	3830	3670	4660	4030
	Vanadium	N/A	<11.0	<10.0	<10.0	<11.0	<10.0	<10.0
	Zinc	2000 ugl	<21.1	37.8 BJ	256	200	302 BJ	<20.0

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 5 of 9

		Site ID	32M-92-06X	32M-92-06X	32M-92-06X	32M-92-07X	32M-92-07X	32M-92-07X
		Field Sample ID	MX3206X1	MX3206X2	MX3206X3	MD3207X2	MF3207X3	MX3207X1
		Sample Date	11/19/92	03/04/93	06/22/93	03/04/93	06/22/93	11/19/92
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**3410**	**1500 J**	**1100 J**	**545 J**	<25.0	**3300**
	Arsenic	50 ugl	**96.6**	**790**	**130**	3.30	<2.00	22.6
	Barium	2000 ugl	44.3	30.0	30.1	5.89	<10.0	29.2
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	30900	10600	8080	5610	4700	6880
	Chromium (total)	100 ugl	32.7	20.6	<10.0	<6.02	<10.0	<6.02
	Cobalt	N/A	<25.0	<25.0	<10.0	<25.0	<10.0	<25.0
	Copper	1000 ugl	<8.09	10.3	<10.0	<8.09	<10.0	<8.09
	Iron	300 ugl	**5190**	**13500**	**6000**	**583**	26.3	**4170**
	Lead	15 ugl	13.8	4.66	7.34	<1.26	<5.00	4.99
	Magnesium	N/A	2060	1240	1230	668	507	1280
	Manganese	50 ugl	**2360**	**3640**	**3700**	23.2 B	7.23	**201**
	Nickel	100 ugl	<34.3	<34.3	<10.0	<34.3	<10.0	<34.3
	Potassium	N/A	21200	4820	3150	1750	<1000	3290
TAL METAL	Silver	40 ugl	<4.60	<4.60	<2.00	<4.60	<2.00	<4.60
	Sodium	N/A	7570	4720	3970	3530	3000	3560
	Vanadium	N/A	<11.0	<11.0	<10.0	<11.0	<10.0	<11.0
	Zinc	2000 ugl	<21.1	24.9	88.3 BJ	21.1	<20.0	<21.1

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 6 of 9

		Site ID	32M-92-07X	32M-92-07X	POL-1	POL-1	POL-1	POL-1
		Field Sample ID	MX3207X2	MX3207X3	MF3208X2	MF3208X3	MX3208X1	MX3208X2
		Sample Date	03/04/93	06/22/93	03/04/93	06/21/93	11/20/92	03/04/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**683 J**	**588 J**	**392**	<25.0	**70900**	**60600 J**
	Arsenic	50 ugl	4.16	6.53	<2.54	<2.00	**650**	**920**
	Barium	2000 ugl	7.53	<10.0	<5.00	<10.0	256	281
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	5650	4350	12800	10900	25700	22400
	Chromium (total)	100 ugl	<6.02	<10.0	<6.02	<10.0	**114**	99.0
	Cobalt	N/A	<25.0	<10.0	<25.0	<10.0	44.3	41.0
	Copper	1000 ugl	<8.09	<10.0	<8.09	<10.0	107	92.7
	Iron	300 ugl	**687**	**863**	**547**	<25.0	**90200**	**73500**
	Lead	15 ugl	<1.26	<5.00	<1.26	<5.00	**160**	**120**
	Magnesium	N/A	664	618	824	660	17400	14400
	Manganese	50 ugl	31.5	27.7	16.4 B	<5.00	**2430**	**2260**
	Nickel	100 ugl	<34.3	<10.0	<34.3	<10.0	**111**	92.9
	Potassium	N/A	925	<1000	1870	1070	17400	18400
TAL METAL	Silver	40 ugl	<4.60	<2.00	<4.60	<2.00	<4.60	<4.60
	Sodium	N/A	3700	2970	6450	5920	10400	8120
	Vanadium	N/A	<11.0	<10.0	<11.0	<10.0	85.8	69.6
	Zinc	2000 ugl	<21.1	43.0 BJ	<21.1	30.2	329	300

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 7 of 9

		Site ID	POL-1	POL-3	POL-3	POL-3	POL-3	POL-3
		Field Sample ID	MX3208X3	MF3210X1	MF3210X3	MX3210X1	MX3210X2	MX3210X3
		Sample Date	06/21/93	11/20/92	06/21/93	11/20/92	03/04/93	06/21/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**31000 J**	<141	<25.0	**116000**	**175000 J**	**31000 J**
	Arsenic	50 ugl	**390**	<2.54	<2.00	**68.4**	**370**	**98.6**
	Barium	2000 ugl	112	15.6	17.7	623	954	211
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	**12.8**	<5.00
	Calcium	N/A	15400	22200	17700	45900	59600	23000
	Chromium (total)	100 ugl	45.6	<6.02	<10.0	**169**	**241**	52.1
	Cobalt	N/A	24.7	<25.0	<10.0	81.8	107	35.0
	Copper	1000 ugl	53.0	<8.09	<10.0	116	158	50.5
	Iron	300 ugl	**37000**	<38.8	<25.0	**213000**	**273000**	**59000**
	Lead	15 ugl	**54.7**	1.95	<5.00	**180**	**230**	**70.5**
	Magnesium	N/A	6880	2660	2080	34300	46700	12000
	Manganese	50 ugl	**998**	3.99	<5.00	**5760**	**8100**	**1600**
	Nickel	100 ugl	38.5	<34.3	>10.0	**144**	**206**	53.9
	Potassium	N/A	6170	1840	1220	37100	62500	10900
TAL METAL	Silver	40 ugl	<2.00	<4.60	<2.00	<4.60	<4.60	<2.00
	Sodium	N/A	6620	11700	10600	15100	16900	11700
	Vanadium	N/A	36.3 J	<11.0	<10.0	176	254	57.2 J
	Zinc	2000 ugl	247 BJ	<21.1	39.4	738	935	320 BJ

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

		Site ID	SHL-15	SHL-15	SHL-15	SHL-15	SHL-25	SHL-25
		Field Sample ID	MF3212X2	MF3212X3	MX3212X2	MX3212X3	MF3211X3	MF3211X3
		Sample Date	06/21/93	07/14/93	03/04/93	07/14/93	06/21/93	07/14/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl		**57.4**	**5340 J**	**1400 J**		<25.0
	Arsenic	50 ugl		2.21	**91.0**	36.6		<2.00
	Barium	2000 ugl		46.4	61.7	53.2		<10.0
	Beryllium	4.0 ugl		<5.00	<5.00	<5.00		<5.00
	Calcium	N/A		22800	14100	22000		16900
	Chromium (total)	100 ugl		<10.0	6.78	<10.0		<10.0
	Cobalt	N/A		10.7	<25.0	12.7		<10.0
	Copper	1000 ugl		<10.0	<8.09	<10.0		<10.0
	Iron	300 ugl		<25.0	**7770**	**2000**		<25.0
	Lead	15 ugl		<5.00	10.7	6.56		<5.00
	Magnesium	N/A		3200	2330	3360		1120
	Manganese	50 ugl		**7700**	**1010**	**7400**		<5.00
	Nickel	100 ugl		10.8	<34.3	14.7		<10.0
	Potassium	N/A		3740	6120	3910		1870
TAL METAL	Silver	40 ugl		<2.00	<4.60	<2.00		<2.00
	Sodium	N/A		10000	6560	9880		15800
	Vanadium	N/A		<10.0	<11.0	<10.0		<10.0
	Zinc	2000 ugl		22.5	62.6	118 BJ		<20.0

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 7
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 32
Units: UGL

Part 9 of 9

		Site ID	SHL-25	SHL-25	SHL-25			
		Field Sample ID	MX3211X1	MX3211X2	MX3211X3			
		Sample Date	11/20/92	03/04/93	07/14/93			
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**5200**	**531 J**	**299 J**			
	Arsenic	50 ugl	17.6	3.09	2.98			
	Barium	2000 ugl	27.6	4.67	<10.0			
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00			
	Calcium	N/A	12200	11800	16500			
	Chromium (total)	100 ugl	12.5	<6.02	<10.0			
	Cobalt	N/A	<25.0	<25.0	<10.0			
	Copper	1000 ugl	<8.09	<8.09	<10.0			
	Iron	300 ugl	**6200**	**578**	**336**			
	Lead	15 ugl	3.58	<1.26	<5.00			
	Magnesium	N/A	2290	943	1200			
	Manganese	50 ugl	**107**	11.8	8.09			
	Nickel	100 ugl	<34.3	<34.3	<10.0			
	Potassium	N/A	4170	1920	1910			
TAL METAL	Silver	40 ugl	<4.60	<4.60	<2.00			
	Sodium	N/A	12900	10500	15600			
	Vanadium	N/A	12.7	<11.0	<10.0			
	Zinc	2000 ugl	<21.1	<21.1	<20.0			

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

Part 1 of 4

		Site ID	43MA93-04X	43MA93-04X	43MA93-05X	43MA93-05X	43MA93-05X	43MA93-06X
		Field Sample ID	MX4304X1	MX4304X2	MD4305X2	MX4305X1	MX4305X2	MX4306X1
		Sample Date	08/20/93	11/12/93	11/12/93	08/20/93	11/12/93	08/20/93
Test	Parameter	Screening Values						
EXPLOSIVES	1,3,5-Trinitrobenzene	N/A	<1.00	<1.00	<1.00 UJ	<1.00	<1.00 UJ	<1.00
	1,3-Nitrobenzene	1.0 ugl	<1.00	<1.00	**12.0 C**	**7.66 C**	**8.97 C**	<1.00
	2,4-Dinitrotoluene	30 ugl	<1.00	<1.00	2.56 U	<1.00 C	<1.00	<1.00
	2,6-DNT	N/A	<1.00	<1.00	<1.00	0.772 JC	<1.00	<1.00
	2-Amino-4,6-dinitrotoluene	N/A	<1.00	<1.00	1.07 U	1.81 C	1.39 U	<1.00
	2-Nitrotoluene	N/A	<1.00	<1.00	<1.00	1.52 C	<1.00	<1.00
	3-Nitrotoluene	N/A	<1.00	<1.00	2.40 CJ	5.91 C	5.04 CJ	<1.00
	4-Amino-2,6-dinitrotoluene	N/A	<1.00	<1.00 UJ	<1.00	<1.00	<1.00	<1.00
	4-Nitrotoluene	N/A	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Cyclonite (RDX)	2.0 ugl	<1.00 J	**2.29 U**	0.310 JC	1.20 C	0.638 JC	<1.00 J
	Cyclotetramethylenetetramine	400 ugl	<1.00	<1.00	<1.00 UJ	2.84 JU	<1.00 UJ	<1.00
EXPLOSIVES	Nitrobenzene	N/A	<1.00	<1.00	1.97 U	5.42 JU	1.99 U	<1.00
	Nitroglycerine	N/A	<1.00	<10.0	<10.0	<10.0 R	<10.0	<10.0 R
	PETN	N/A	<10.0 R	<10.0	<10.0	<10.0 R	<10.0	<10.0 R
TCL BNA	1-Methylnaphthalene	N/A						
	13DNAP	N/A						
	2-Methylnapthakene	10 ugl	<10.0	<10.0	<120.0 K	<10.0	<10.0	<10.0
	25DMPA	N/A						
	4,4'-Butylidenebis[2-(1,1-dime	N/A				24.0		
	6-Aminohexanoic acid lactam	N/A						
	Acenapthene	20 ugl	<10.0	<10.0	<12.0 K	<10.0	<10.0	<10.0
TCL BNA	Di-n-butyl-phthalate	N/A						
	Napthalene	20 ugl	<10.0	<10.0	<12.0 K	<10.0	<10.0	<10.0
	PAH	N/A						
	Phenanthrene	300 ugl	<10.0	<10.0	<12.0 K	<10.0	<10.0	<10.0
	Tetradecane	N/A						

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

File Type: CGW
Site Type: WELL

Part 1 of 4

		Site ID	43MA93-04X	43MA93-04X	43MA93-05X	43MA93-05X	43MA93-05X	43MA93-06X
		Field Sample ID	MX4304X1	MX4304X2	MD4305X2	MX4305X1	MX4305X2	MX4306X1
		Sample Date	08/20/93	11/12/93	11/12/93	08/20/93	11/12/93	08/20/93
Test	Parameter	Screening Values						
TCL Pest	Aldrin	N/A	<0.020 R	<0.020	0.420 J	<1.00 R	0.300 J	<0.250 R
	DDT	0.30 ugl	<0.040	<0.040	**5.00 UJ**	**7.50 U**	**3.60 UJ**	<0.040
	alpha-Benzenehexachloride	N/A	<0.020	<0.020	18.0 UJ	20.0 U	13.0 UJ	<0.020
	alpha-Endosulfan	0.40 ugl	<0.237	<0.020	<0.100	<1.00	0.120	<0.180
	delta-BHC	N/A	<0.020	<0.020	2.60 J	3.30 J	2.00 J	<0.020
TCL VOA	1,2-Dimethylbenzene/ o-xyle	N/A	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	1,2-Dichloroethane	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
TCL VOA	1,3-and/or 1,4-Dimethylbenze	N/A	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	123TMB	N/A						
	Acetone	3000 ugl	<10.0	<10.0	<10.0	23.0	<10.0	<10.0
	Chloroform	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Methylene chloride	5.0 ugl	<5.00	<5.00	4.00 B	<5.00	<5.00	<5.00
	Trichloroethylene (TCE)	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Xylene	N/A						
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	**1050 J**	**1250 J**	**1070 J**	742 J	438 J	<2000
WQP	Chloride	250000 ugl	24000	11000	**600000**	**800000**	**600000**	68000
	Hardness	N/A	40000	140000	56000	92000	54000	81000
	Nitrate	10000 ugl	4000	3100	3300	1500	3400	2500
	Sulfate	250000 ugl	40000	110000	34000	27000	34000	51000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

File Type: CGW
Site Type: WELL

Part 2 of 4

		Site ID	43MA93-06X	43MA93-07X	43MA93-07X	43MA93-08X	43MA93-08X	43MA93-08X
		Field Sample ID	MX4306X2	MX4307X1	MX4307X2	MD4308X1	MX4308X1	MX4308X2
		Sample Date	11/11/93	08/20/93	11/12/93	08/20/93	08/20/93	11/12/93
Test	Parameter	Screening Values						
EXPLOSIVES	1,3,5-Trinitrobenzene	N/A	<1.00	<1.00	<1.00	<1.00 J	<1.00 J	<1.00 J
	1,3-Nitrobenzene	1.0 ugl	<1.00 J	<1.00	<1.00	<1.00 J	<1.00 J	0.201 B
	2,4-Dinitrotoluene	30 ugl	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	2,6-DNT	N/A	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	2-Amino-4,6-dinitrotoluene	N/A	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	2-Nitrotoluene	N/A	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	3-Nitrotoluene	N/A	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	4-Amino-2,6-dinitrotoluene	N/A	<1.00	<1.00	0.241 B	<1.00	<1.00	<1.00 J
	4-Nitrotoluene	N/A	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Cyclonite (RDX)	2.0 ugl	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00
	Cyclotetramethylenetetramine	400 ugl	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	Nitrobenzene	N/A	<1.00	<1.00	<1.00	<1.00 J	<1.00 J	<1.00
EXPLOSIVES	Nitroglycerine	N/A	<10.0	<10.0 R	<10.0	<10.0 R	<10.0 R	<10.0
	PETN	N/A	<10.0	<10.0 R	<10.0	<10.0 R	<10.0 R	<10.0
TCL BNA	1-Methylnaphthalene	N/A						
	13DNAP	N/A						
	2-Methylnapthalene	10 ugl	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	25DMPA	N/A						
	4,4'-Butylidenebis[2-(1,1-dime	N/A						
	6-Aminohexanoic acid lactam	N/A						
	Acenapthene	20 ugl	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	Di-n-butyl-phthalate	N/A						
	Napthalene	20 ugl	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
TCL BNA	PAH	N/A						
	Phenanthrene	300 ugl	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	Tetradecane	N/A						

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

Part 2 of 4

		Site ID	43MA93-06X	43MA93-07X	43MA93-07X	43MA93-08X	43MA93-08X	43MA93-08X
		Field Sample ID	MX4306X2	MX4307X1	MX4307X2	MD4308X1	MX4308X1	MX4308X2
		Sample Date	11/11/93	08/20/93	11/12/93	08/20/93	08/20/93	11/12/93
Test	Parameter	Screening Values						
TCL Pest	Aldrin	N/A	<0.024 K	<0.020 R	<0.020	<0.020 R	<0.020 R	<0.020
	DDT	0.30 ugl	<0.049 K	<0.040	<0.040	<0.040	<0.040	<0.040
	alpha-Benzenehexachloride	N/A	<0.024 K	<0.020	<0.020	<0.020	<0.020	<0.020
	alpha-Endosulfan	0.40 ugl	<0.024 K	<0.063	<0.020	<0.135	<0.106	<0.020
	delta-BHC	N/A	<0.024 K	<0.020	<0.020	<0.020	<0.020	<0.020
TCL VOA	1,2-Dimethylbenzene/ o-xyle	N/A	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	1,2-Dichloroethane	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
TCL VOA	1,3-and/or 1,4-Dimethylbenze	N/A	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	123TMB	N/A						
	Acetone	3000 ugl	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	Chloroform	5.0 ugl	<5.00	5.00	<5.00	<5.00	<5.00	<5.00
	Methylene chloride	5.0 ugl	<5.00	<5.00	3.00 B	<5.00	<5.00	4.40 B
	Trichloroethylene (TCE)	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Xylene	N/A						
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	678 J	<2000	187 J	295	<2000	333 J
WQP	Chloride	250000 ugl	81000	36000	48000		37000	20000
	Hardness	N/A	110000	72000	120000	58000	57000	67000
	Nitrate	10000 ugl	2450	2600	1300	1100 J	1080 J	1400
	Sulfate	250000 ugl	14000	22000	30000		43000	43000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

Part 3 of 4

		Site ID	43MA93-10X	POL-1	POL-1	POL-1	POL-2	POL-2
		Field Sample ID	MX4310X2	MX3208X1	MX3208X2	MX3208X3	MX3209X1	MX3209X2
		Sample Date	11/12/93	11/20/92	03/04/93	06/21/93	11/20/92	03/04/93
Test	Parameter	Screening Values						
EXPLOSIVES	1,3,5-Trinitrobenzene	N/A	2.18 C			<1.00		
	1,3-Nitrobenzene	1.0 ugl	**1.00 BC**			<1.00		
	2,4-Dinitrotoluene	30 ugl	1.70 U			<1.00		
	2,6-DNT	N/A	4.60 J			<1.00		
	2-Amino-4,6-dinitrotoluene	N/A	1.57 C			<1.00		
	2-Nitrotoluene	N/A	<1.00			<1.00		
	3-Nitrotoluene	N/A	2.81 C			<1.00		
	4-Amino-2,6-dinitrotoluene	N/A	3.96 C			<1.00		
	4-Nitrotoluene	N/A	1.13 C			<1.00		
	Cyclonite (RDX)	2.0 ugl	<1.00 J			<1.00		
EXPLOSIVES	Cyclotetrta-ethylenetetramine	400 ugl	<1.00			<1.00		
	Nitrobenzene	N/A	<1.00			<1.00		
	Nitroglycerine	N/A	11.4 U			<10.0		
	PETN	N/A	16.3 U			<10.0		
TCL BNA	1-Methylnaphthalene							30.0
	13DNAP	N/A	17.0					
	2-Methylnapthalene	10 ugl	**30.0**	<1.70	<1.70			**34.0**
	25DMPA	N/A	7.40					
	4,4'-Butylidenebis[2-(1,1-dime	N/A						
	6-Aminohexanoic acid lactam	N/A		60.0	5.00			
	Acenapthene	20 ugl	<10.0	<1.70	<1.70			2.10
TCL BNA	Di-n-butyl-phthalate	N/A		4.00	<3.70			<3.70

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

Part 3 of 4

		Site ID	43MA93-10X	POL-1	POL-1	POL-1	POL-2	POL-2
		Field Sample ID	MX4310X2	MX3208X1	MX3208X2	MX3208X3	MX3209X1	MX3209X2
		Sample Date	11/12/93	11/20/92	03/04/93	06/21/93	11/20/92	03/04/93
Test	Parameter	Screening Values						
	Napthalene	20 ugl	7.70 J	<0.500	<0.500			3.20
	PAH	N/A	9.20					
	Phenanthrene	300 ugl	6.30 J	<0.500	<0.500			1.30
	Tetradecane	N/A	71.0					
TCL Pest	Aldrin	N/A	<0.100	<0.092	<0.092			<0.092
	DDT	0.30 ugl	<0.200	<0.034	<0.034			<0.034
	alpha-Benzenehexachloride	N/A	<0.400	<0.039	<0.039			<0.039
	alpha-Endosulfan	0.40 ugl	0.130	<0.023	<0.023			<0.023
	delta-BHC	N/A	<0.400	<0.029	<0.029			<0.029
TCL VOA	1,2-Dimethylbenzene/ o-xyle	N/A	9.10					
TCL VOA	1,2-Dichloroethane	5.0 ugl	<5.00	<0.500	<0.500		<0.500	<0.500
	1,3-and/or 1,4-Dimethylbenze	N/A	13.0					
	123TMB	N/A	26.0					
	Acetone	3000 ugl	<10.0	<13.0	<13.0		<13.0	<13.0
	Chloroform	5.0 ugl	<5.00	<0.500	<0.500		<0.500	<0.500
	Methylene chloride	5.0 ugl	<5.00	<2.30	<2.30		<2.30	<2.30
	Trichloroethylene (TCE)	5.0 ugl	<5.00	0.730	<0.500		<0.500	<0.500
	Xylene	N/A		<0.840	<0.840		1.30	13.0
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl	**7820**	<1710	<202			301
WQP	Chloride	250000 ugl	26000					
	Hardness	N/A	71000	62600	57200	67000		57800
	Nitrate	10000 ugl	355					
WQP	Sulfate	250000 ugl	30000					

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

Part 4 of 4

		Site ID	POL-2	POL-3	POL-3	POL-3		
		Field Sample ID	MX3209X3	MX3210X1	MX3210X2	MX3210X3		
		Sample Date	06/21/93	11/20/92	03/04/93	06/21/93		
Test	Parameter	Screening Values						
EXPLOSIVES	1,3,5-Trinitrobenzene	N/A	3.04 LC			<1.00		
	1,3-Nitrobenzene	1.0 ugl	<1.00			<1.00		
	2,4-Dinitrotoluene	30 ugl	<1.00			<1.00		
	2,6-DNT	N/A	<1.00			<1.00		
	2-Amino-4,6-dinitrotoluene	N/A	<1.00 LUJ			<1.00		
	2-Nitrotoluene	N/A	<1.00			<1.00		
	3-Nitrotoluene	N/A	0.600 JC			<1.00		
	4-Amino-2,6-dinitrotoluene	N/A	1.91 C			<1.00		
	4-Nitrotoluene	N/A	1.38 C			<1.00		
	Cyclonite (RDX)	2.0 ugl	0.673 JC			<1.00		
	Cyclotetramenthylenetetramine	400 ugl	<1.00			<1.00		
	Nitrobenzene	N/A	1.81 JU			<1.00		
EXPLOSIVES	Nitroglycerine	N/A	<10.0			<10.0		
	PETN	N/A	<10.0			<10.0		
TCL BNA	1-Methylnaphthalene	N/A						
	13DNAP	N/A						
	2-Methylnapthalene	10 ugl		<.70	<1.70			
	25DMPA	N/A						
	4,4'-Butylidenebis[2-(1,1-dime	N/A						
	6-Aminohexanoic acid latem	N/A			20.0			
	Acenapthene	20 ugl		<1.70	<1.70			
	Di-n-butyl-phthalate	N/A		<3.70	<3.70			
	Napthalene	20 ugl		<0.500	<0.500			
TCL BNA	PAH	N/A						
	Phenanthrene	300 ugl		<0.500	<0.500			
	Tetradecane	N/A						

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 8
Chemical Summary Report For Organics and Water Quality Parameters in Groundwater
Area of Contamination: 43A
Units: UGL

Part 4 of 4

		Site ID	POL-2	POL-3	POL-3	POL-3		
		Field Sample ID	MX3209X3	MX3210X1	MX3210X2	MX3210X3		
		Sample Date	06/21/93	11/20/92	03/04/93	06/21/93		
Test	Parameter	Screening Values						
TCL Pest	Aldrin	N/A		<0.092	<0.092			
	DDT	0.30 ugl		<0.034	<0.034			
	alpha-Benzenehexachloride	N/A		<0.039	<0.039			
	delta-BHC	N/A		<0.029	<0.029			
TCL VOA	1,2-Dimethylbenzene/ o-xyle	N/A						
	1,2-Dichloroethane	5.0 ugl		<0.500	0.790			
	1,3-and/or 1,4-Dimethylbenze	N/A						
	123TMB	N/A						
TCL VOA	Acetone	3000 ugl		<13.0	<13.0			
	Chloroform	5.0 ugl		0.730	<0.500			
	Methylene chloride	5.0 ugl		<2.30	<2.30			
	Trichloroethylene (TCE)	5.0 ugl		**19.0**	**17.0**			
	Xylene	N/A		<0.840	<0.840			
TPHC	Tot. Petroleum Hydrocarbons	1000 ugl		<1710	<207			
WQP	Chloride	250000 ugl						
	Hardness	N/A	61000	113000	126000	110000		
	Nitrate	10000 ugl						
	Sulfate	250000 ugl						

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 9
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 43A
Units: UGL

Part 1 of 7

			Site ID	43MA93-04X	43MA93-04X	43MA93-04X	43MA93-04X	43MA93-05X	43MA93-05X
			Field Sample ID	MF4304X1	MF4304X2	MX4304X1	MX4304X2	MD4305F2	MD4305X2
			Sample Date	08/20/93	11/12/93	08/20/93	11/12/93	11/12/93	11/12/93
Test	Parameter	Screening Values							
TAL METAL	Aluminum	50 ugl	**104 B**	**178**	**2220**	**3970**	49.3	**122**
	Antimony	6.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Arsenic	50 ugl	<2.00	1.35 J	30.2	**62.3**	6.39	6.00
	Barium	2000 ugl	21.2	30.1	25.7	41.6	33.4	35.8
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	0.441 J	<5.00	<5.00
	Cadmium	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	12900	40000	12200	37500	19100	19800
	Chromium (total)	100 ugl	4.96 BJ	<10.0	**4.85 J**	6.80 J	4.89 J	4.73 J
	Cobalt	N/A	5.75 J	<10.0	4.50 J	4.05 J	<10.0	<10.0
	Copper	1000 ugl	<10.0	<10.0	4.31 BJ	4.06 J	<10.0	<10.0
	Iron	300 ugl	23.0 J	**14.4 J**	**2960**	**5340**	39.1	114
	Lead	15 ugl	<5.00	<5.00	3.60 J	4.78 J	<5.00	<5.00
	Magnesium	N/A	1700	10100	2220	10400	1500	1570
TAL METAL	Manganese	50 ugl	**596**	**513**	**659**	**559**	19.9	21.5
	Nickel	100 ugl	<10.0	<10.0	9.29 J	14.3	<10.0	<10.0
	Potassium	N/A	4690	4090	5110	4190	7680	7640
	Selenium	50 ugl	<2.00	<2.00	1.67 KJ	<2.00	<2.00	<2.00
	Silver	40 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Sodium	N/A	19000	14200	20600	12100	410000	420000
	Thallium	2.0 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Vanadium	NA	<10.0	<10.0	<10.0	6.37 J	<10.0	<10.0
	Zinc	2000 ugl	7.97 BJ	1.21 B	21.1 B	30.7 B	190	200

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 9
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 43A
Units: UGL

Part 2 of 7

		Site ID	43MA93-05X	43MA93-05X	43MA93-05X	43MA93-05X	43MA93-06X	43MA93-06X
		Field Sample ID	MF4305X1	MF4305X2	MX4305X1	MX4305X2	MF4306X1	MF4306X2
		Sample Date	08/20/93	11/12/93	08/20/93	11/12/93	08/20/93	11/11/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**69.9 B**	**92.3**	**149**	**80.6**	**141 B**	**446**
	Antimony	6.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Arsenic	50 ugl	20.5	63.9	41.0	5.57	<2.00	0.960 J
	Barium	2000 ugl	18.7	33.7	19.5	33.8	64.1	81.0
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	0.125 J	0.311 J
	Cadmium	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	33600	19600	32100	19000	15600	19900
	Chromium (total)	100 ugl	27.9	4.63 J	27.9	3.24 J	<10.0	<10.0
	Cobalt	N/A	<10.0	<10.0	<10.0	<10.0	4.20 J	<10.0
	Copper	1000 ugl	1.70 J	<10.0	4.10 BJ	<10.0	<10.0	3.54 J
	Iron	300 ugl	<25.0	100	202	87.6	<25.0	19.4 J
	Lead	15 ugl	<5.00	<5.00	<5.00	3.63 J	<5.00	2.32 J
	Magnesium	N/A	2870	1540	2870	1490	2500	2280
TAL METAL	Manganese	50 ugl	3.99 BJ	21.3	9.93	19.8	**205**	**145**
	Nickel	100 ugl	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	Potassium	N/A	29200	7740	31300	7910	3320	2620
	Selenium	50 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Silver	40 ugl	<2.00	4.02	<2.00	<2.00	<2.00	<2.00
	Sodium	N/A	270000	420000	310000	420000	38900	49400
	Thallium	2.0 ugl	1.01 J	<2.00	<2.00	<2.00	<.2.00	<2.00
	Vanadium	N/A	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
	Zinc	2000 ugl	6.01 BJ	196	22.6 B	191	4.17 BJ	9.99 B

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 9
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 43A
Units: UGL

Part 3 of 7

		Site ID	43MA93-06X	43MA93-06X	43MA93-07X	43MA93-07X	43MA93-07X	43MA93-07X
		Field Sample ID	MX4306X1	MX4306X2	MF4307X1	MF43072X	MX4307X1	MX4307X2
		Sample Date	08/20/93	11/11/93	08/20/93	11/12/93	08/20/93	11/12/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**22000**	**23000**	22.7 BJ	31.5	**18000**	**19000**
	Antimony	6.0 ugl	5.67	4.08 J	<5.00	5.00	3.44 J	<5.00
	Arsenic							
	Barium	2000 ugl	186	217	32.6	63.5	**210**	**160**
	Beryllium	4.0 ugl	1.60 J	1.96 J	<5.00	<5.00	1.12 J	1.41 J
	Cadmium	5.0 ugl	<5.00	4.56 B	<5.00	<5.00	<5..00	<5.00
	Calcium	N/A	17800	23600	16000	34300	17100	31000
	Chromium (total)	100 ugl	49.6	64.7	<10.0	<10.0	49.1	47.0
	Cobalt	N/A	51.6	54.0	<10.0	<10.0	21.9	27.6
	Copper	1000 ugl	68.1	85.3	<10.0	<10.0	640	71.3
	Iron	300 ugl	**44000**	**53000**	**418**	**396**	**47000**	**49000**
	Lead	15 ugl	**98.8**	**59.4**	<5.00	<5.00	**61.5**	**43.9**
	Magnesium	N/A	8880	11200	1490	2860	7090	9550
TAL METAL	Manganese	50 ugl	**2200**	**1900**	**96.2**	**107**	**691**	**705**
	Nickel	100 ugl	82.5	92.6	<10.0	<10.0	71.3	78.7
	Potassium	N/A	6560	6440	2140	2080	4850	4340
	Selenium	50 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Silver	40 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Sodium	N/A	41400	51500	27200	25900	31700	22600
	Thallium	2.0 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Vanadium	N/A	37.4	53.6	<10.0	<10.0	34.2	42.0
	Zinc	2000 ugl	118	357	5.70 BJ	8.74 B	82.9	96.2

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 9
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 43A
Units: UGL

Part 4 of 7

		Site ID	43MA93-08X	43MA93-08X	43MA93-08X	43MA93-08X	43MA93-08X	43MA93-08X
		Field Sample ID	MD4308F1	MD4308X1	MF4308X1	MF4308X2	MX4308X1	MX4308X2
		Sample Date	08/20/93	08/20/93	08/20/93	11/12/93	08/20/93	11/12/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	34.6 B	**1850**	**86.2**	38.6	1760	**2800**
	Antimony	6.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Arsenic	50 ugl	<2.00	14.7	<2.00	<2.00	15.4	23.1
	Barium	2000 ugl	31.4	50.2	30.6	32.7	50.1	54.8
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Cadmium	5.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Calcium	N/A	19400	18600	19600	22000	18400	21300
	Chromium (total)	100 ugl	<10.0	7.21 J	<10.0	<10.0	5.37 J	6.44 J
	Cobalt	N/A	4.92 J	<10.0	<10.0	<10.0	<10.0	2.65 J
	Copper	1000 ugl	<10.0	5.39 B	<10.0	<10.0	4.40 BJ	5.50 J
	Iron	300 ugl	18.3 J	**3210**	24.5 J	24.4 J	**3250**	**4900**
	Lead	15 ugl	<5.00	7.66	<5.00	<5.00	7.24	11.1
	Magnesium	N/A	2180	2660	2180	2620	2640	3270
TAL METAL	Manganese	50 ugl	25.1	**103**	25.8	19.1	**105**	**123**
	Nickel	100 ugl	9.82 J	11.1	<10.0	9.58 J	14.4	15.5
	Potassium	N/A	2050	2820	2200	1330	2710	873 J
	Selenium	50 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Silver	40 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Sodium	N/A	8800	9820	8880	12400	9660	12600
	Thallium	2.0 ugl	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
	Vanadium	N/A	<10.0	<10.0	<10.0	<10.0	<10.0	5.24 J
	Zinc	2000 ugl	10.8 B	44.9 B	10.5 BJ	11.0 B	24.2 B	33.2 B

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 9
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 43A
Units: UGL

Part 5 of 7

		Site ID	43MA93-10X	43MA93-10X	POL-1	POL-1	POL-1	POL-1
		Field Sample ID	MF4310X2	MX4310X2	MF3208X2	MF3208X3	MX3208X1	MX3208X2
		Sample Date	11/12/93	11/12/93	03/04/93	06/21/93	11/20/92	03/04/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	28.1	**113**	**392**	<25.0	**70900**	**60600 J**
	Antimony	6.0 ugl	<5.00	<5.00	<3.03	<5.00	<3.03	<3.03
	Arsenic	50 ugl	15.1	16.8	<2.54	<2.00	**650**	**920**
	Barium	2000 ugl	27.2	27.9	5.00	<10.0	256	281
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Cadmium	5.0 ugl	<5.00	<5.00	<4.01	<5.00	<4.01	<4.01
	Calcium	N/A	23100	23400	12800	10900	25700	22400
	Chromium (total)	100 ugl	<10.0	<10.0	<6.02	<10.0	**114**	99.0
	Cobalt	N/A	9.84 J	9.67 J	<25.0	<10.0	44.3	41.0
	Copper	1000 ugl	<10.0	<10.0	<8.09	<10.0	107	92.7
	Iron	300 ugl	**1560**	**1650**	**547**	<25.0	**90200**	**73500**
	Lead	15 ugl	4.05 J	9.47	<1.26	<5.00	**160**	**120**
	Magnesium	N/A	2990	2960	824	660	17400	14400
TAL METAL	Manganese	50 ugl	**887**	**859**	16.4 B	<5.00	**2430**	**2260**
	Nickel	100 ugl	10.2	13.7	<34.3	<10.0	**111**	92.9
	Potassium	N/A	1910	1740	1870	1070	17400	18400
	Selenium	50 ugl	<2.00	<2.00	<3.02	<2.00	<3.02	<3.02
	Silver	40 ugl	<2.00	<2.00	<4.60	<2.00	<4.60	<4.60
	Sodium	N/A	17800	16400	6540	5920	10400	8120
	Thallium	2.0 ugl	<2.00	<2.00	<6.99	<2.00	<6.99	<6.99
	Vanadium	N/A	<10.0	<10.0	<11.0	<10.0	85.8	69.6
	Zinc	2000 ugl	15.3 B	13.2 B	<21.1	30.2	329	300

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 9
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 43A
Units: UGL

Part 6 of 7

		Site ID	POL-1	POL-2	POL-2	POL-2	POL-3	POL-3
		Field Sample ID	MX3208X3	MF3209X3	MX3209X2	MX3209X3	MF3210X1	MF3210X3
		Sample Date	06/21/93	06/21/93	03/04/93	06/21/93	11/20/92	06/21/93
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**31000 J**	<25.0	**11700 J**	**3500**	<141	25.0
	Antimony	6.0 ugl	<5.00	<5.00	<3.03	<5.00	<3.03	<5.00
	Arsenic	50 ugl	**390**	<2.00	**120**	23.3	<2.54	<2.00
	Barium	2000 ugl	112	11.2	41.7	26.1	15.6	17.7
	Beryllium	4.0 ugl	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
	Cadmium	5.0 ugl	<5.00	<5.00	<4.01	<5.00	<4.01	<5.00
	Calcium	N/A	15400	18200	19100	17900	22200	17700
	Chromium (total)	100 ugl	45.6	<10.0	36.2	11.2	<6.02	<10.0
	Cobalt	N/A	24.7	<10.0	<25.0	<10.0	<25.0	<10.0
	Copper	1000 ugl	53.0	<10.0	18.9	10.4	<8.09	<10.0
	Iron	300 ugl	**37000**	<25.0	**15000**	**5900**	<38.8	<25.0
	Lead	15 ugl	**54.7**	<5.00	**16.1**	8.59	1.95	<5.00
	Masgnesium	N/A	6880	2880	4850	3870	2660	2080
TAL METAL	Manganese	50 ugl	**998**	**511**	**502**	**632**	3.99	<5.00
	Nickel	100 ugl	38.5	<10.0	<34.3	<10.0	<34.3	<10.0
	Potassium	N/A	6170	1640	2960	1870	1840	1220
	Selenium	50 ugl	<2.00	<2.00	<3.02	<2.00	<3.02	<2.00
	Silver	40 ugl	<2.00	<2.00	<4.60	<2.00	<4.60	<2.00
	Sodium	N/A	6620	15700	15100	15300	11700	10600
	Thallium	2.0 ugl	<2.00	<2.00	<6.99	<2.00	<6.99	<2.00
	Vanadium	N/A	36.3 J	<10.0	13.6	<10.0	<11.0	<10.0
	Zinc	2000 ugl	247 BJ	<20.0	34.8	91.3 B	<21.1	39.4

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CGW
Site Type: WELL

Table 9
Chemical Summary Report For Metals in Groundwater
Area of Contamination: 43A
Units: UGL

Part 7 of 7

		Site ID	POL-3	POL-3	POL-3			
		Field Sample ID	MX3210X1	MX3210X2	MX3210X3			
		Sample Date	11/20/92	03/04/93	06/2/93			
Test	Parameter	Screening Values						
TAL METAL	Aluminum	50 ugl	**116000**	**175000 J**	**31000 J**			
	Antimony	6.0 ugl	<3.03	<3.03	<5.00			
	Arsenic	50 ugl	**68.4**	**370**	**98.6**			
	Barium	2000 ugl	623	954	211			
	Beryllium	4.0 ugl	<5.00	**12.8**	5.00			
	Cadmium	5.0 ugl	<4.01	<4.01	<5.00			
	Calcium	N/A	45900	59600	23000			
	Chromium (total)	100 ugl	**169**	**241**	52.1			
	Cobalt	N/A	81.8	107	35.0			
	Copper	1000 ugl	116	158	50.5			
	Iron	300 ugl	**213000**	**273000**	**59000**			
	Lead	15 ugl	**180**	**230**	**70.5**			
	Magnesium	N/A	34300	46700	12000			
TAL METAL	Manganese	50 ugl	**5760**	**8100**	**1600**			
	Nickel	100 ugl	**144**	**206**	53.9			
	Potassium	N/A	37100	62500	10900			
	Selenium	50 ugl	<3.02	<3.02	<2.00			
	Silver	40 ugl	<4.60	<4.60	<2.00			
	Sodium	N/A	15100	16900	11700			
	Thallium	2.0 ugl	<6.99	<6.99	<2.00			
	Vanadium	N/A	176	254	57.2 J			
	Zinc	2000 ugl	738	935	320 BJ			

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CBX
Site Type: ASPH

Table 10
Chemical Summary Report For Asphalt Cores
Area of Contamination: 32
Units: UGG

Part 1 of 3

		Site ID	32C-92-01X	32C-92-02X	32C-92-03X	32C-92-04X	32C-92-04X	32C-92-05X
		Field Sample ID	CX3201X1	CX3202X1	CX3203X1	CD3204X1	CX3204X1	CX3205X1
		Sample Date	10/19/92	10/19/92	10/19/92	10/20/92	10/20/92	10/20/92
Test	Parameter	Screening Values						
TCL Pest	DDE	2.0 ugg	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
	DDT	2.0 ugg	0.008 C	<0.007	<0.007	<0.007	<0.007	<0.007
	PCB-1248	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
	PCB-1254	2.0 ugg	<0.082	<0.082	<0.082	0.253 C	0.191 C	0.500 C
	PCB-1260	2.0 ugg	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CBX
Site Type: ASPH

Table 10
Chemical Summary Report For Asphalt Cores
Area of Contamination: 32
Units: UGG

Part 2 of 3

		Site ID	32C-92-06X	32C-92-07X	32C-92-08X	32C-92-09X	32C-92-10X	32C-92-11X
		Field Sample ID	CX3206X1	CX3207X1	CX3208X1	CX3209X1	CX3210X1	CX3211X1
		Sample Date	10/19/92	10/20/92	10/20/92	10/20/92	10/20/92	10/20/92
Test	Parameter	Screening Values						
TCL Pest	DDE	2.0 ugg	<0.008	<0.008	0.110 C	0.048 C	0.077 C	0.029 C
	DDT	2.0 ugg	<0.007	<0.007	0.620 C	0.130 C	0.270 C	0.290 C
	PCB-1248	2.0 ugg	<0.082	<0.082	<0.082	<0.082	<0.082	0.145 C
	PCB-1254	2.0 ugg	0.239 C	5.50 C	9.30 C	2.60 C	4.60 C	<0.082
	PCB-1260	2.0 ugg	<0.080	<0.080	0.038 C	<0.080	<0.080	<0.080

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CBX
Site Type: ASPH

Table 10
Chemical Summary Report For Asphalt Cores
Area of Contamination: 32
Units: UGG

Part 3 of 3

		Site ID	32C-92-12X	32C-92-13X	32C-92-14X	32c-92-15X		
		Field Sample ID	CX3212X1	CX3213X1	CX3214X1	CX3215X1		
		Sample Date	10/20/92	10/20/92	10/19/92	10/19/92		
Test	Parameter	Screening Values						
TCL Pest	DDE	2.0 ugg	0.020 C	0.017 C	0.012 C	0.010 C		
	DDT	2.0 ugg	0.069 C	0.078 C	0.019 C	0.026 C		
	PCB-1248	2.0 ugg	<0.082	0.730 C	<0.082	0.388 C		
	PCB-1254	2.0 ugg	0.800 C	<0.082	0.231 C	<0.082		
	PCB-1260	2.0 ugg	<0.080	<0.080	<0.080	0.177 C		

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSW
Site Type: POND

Table 11
Chemical Summary Report For Surface Water
Area of Contamination: 32
Units: UGL

Part 1 of 1

		Site ID	32C-92-01X	32D-92-01X				
		Field Sample ID	WD3201X1	WX3201X1				
		Sample Date						
Test	Parameter	Screening Values						
TAL METAL	Aluminum	N/A	805 J	255 J				
	Antimony	14 ugl	5.18	6.43				
	Arsenic	0.018 ugl	**2.77 J**	<2.54 J				
	Barium	N/A	26.7 J	12.3 J				
	Cadmium	N/A	14.0	16.2				
	Calcium	N/A	5180	4730				
	Copper	12 ugl	**28.0**	**25.3**				
	Iron	N/A	1500 J	566 J				
	Lead	3.2 ugl	**49.1 J**	**33.1 J**				
	Magnesium	N/A	1060	877				
	Manganese	N/A	94.5 BJ	58.8 J				
	Potassium	N/A	2620 B	2500 B				
	Sodium	N/A	3180	2910				
	Zinc	110 ugl	**258**	**267**				
WQP	Alkalinity	N/A	17000	14000				
	Chloride	N/A	3970	2990				
	Hardness	N/A	16000	16000				
	Nitrogen, Kjeldahl Method	N/A	524	562				
	Nitrogen, NO3/NO2	N/A	620	620				
	Phosphate	N/A	88.1	87.1				
	Total suspended solids	N/A	25000 K	29000 K				

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

File Type: CSE
Site Type: POND

Table 12
Chemical Summary Report For Sediments
Area of Contamination: 32
Units: UGL

Part 1 of 1

		Site ID	32C-92-01X	32D-92-01X	32D-92-02X	32D-93-03X	32D-93-03X	32D-93-04X	32D-93-04X
		Field Sample ID	DD3201X1	DX3201X1	DX3202X1	DX3203X1	DX3203X1	DX3204X1	DX3204X1
		Sample Date	10/20/92	10/20/92	10/20/92	06/22/93	07/14/93	06/22/93	07/14/93
Test	Parameter	Screening Values							
TAL METAL	Aluminum	1000000 ugg	4120	3820	6380	12000		4800	
	Antimony	40 ugg	<1.09	<1.09	2.85	1.91		<0.500	
	Arsenic	30 ugg	9.12	11.3	18.0	25.2		12.3	
	Barium	72000 ugg	29.7	22.6	72.4	32.2		12.5	
	Cadmium	80 ugg	2.66	3.33	17.1	8.97		3.33	
	Calcium	N/A	986 J	2600 J	2040	1360		<500	
	Chromium (total)	5000 ugg	9.15	12.9	32.6	30.8		11.6	
	Cobalt	N/A	3.84	5.02	7.19	10.0		5.24	
	Copper	38000 ugg	10.7	13.5	41.3	57.6		10.5	
	Iron	N/A	11200	11100	14700	16000		6500	
	Lead	500 ugg	55.0	69.0	220	119		22.0	
	Magnesium	N/A	2060	2800	3010	3380		1320	
	Manganese	5100 ugg	160	215	344	152		86.7	
	Mercury	60 ugg	<0.050	<0.050	0.182	<0.100		<0.100	
	Nickel	700 ugg	14.3	19.3	47.4	107		25.2	
TAL METAL	Potassium	N/A	500	407	1140	654		313	
	Silver	200 ugg	<0.589	<0.589	0.874	<0.200		<0.200	
	Sodium	N/A	231	210	323	<200		<200	
	Vanadium	7200 ugg	10.3	16.9	26.3	20.4		8.19	
	Zinc	5000 ugg	85.1	73.0	389	350		71.6	
TCL Pest	DDD	10 ugg	<0.008	0.011 C	<0.083		<0.010		0.011 JC
	DDT	9.0 ugg	0.030 C	0.028 C	0.360 C		<0.010		<0.010
	Lindane	N/A	<0.006	<0.006	<0.006		0.021 JC		<0.005
	PCB1254	2.0 ugg	0.306 C	0.250 C	**4.90 C**		<0.100		<0.100
TOC	Total Organic Carbon	N/A	2550 J	9240 J	36800 J	212000		42400	
TPHC	Tot. Petroleum Hydrocarbons	5000 ugg	3000	2380	2690	169		161	

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

Table 13
Chemical Summary Report of Air Sampling Results For
Metals and PM_{10}
Area of Contamination: 32
(ug/m^3)

Parameters	AX3201P1	AX3202P1	AX3203P1	AB3200P1*
Silver	<0.064	<0.056	<0.055	<0.40
Aluminum	5.87	5.99	6.13	40.23
Arsenic	<0.0044	<0.044	<0.044	<0.034
Barium	<0.14	<0.13	<0.13	<1.00
Calcium	13.12	14.62	13.33	102.92
Cadmium	<0.082	<0.071	<0.060	<0.55
Cobalt	<0.0086	<0.0079	<0.0078	<0.061
Chromium	0.089	0.089	0.091	0.80
Copper	0.0096	<0.0051	0.0022	0.016
Iron	0.40	0.40	0.38	3.22
Mercury	<0.018	<0.016	<0.015	<0.12
Potassium	2.29	2.18	1.62	14.52
Magnesium	<1.53	<1.84	2.42	12.34
Manganese	0.019	0.027	0.012	0.092
Sodium	4.06	5.17	7.80	44.74
Nickel	0.020	0.015	0.012	0:13
Lead	<0.015	0.0059	0.0072	0.064
Antimony	<0.10	<0.10	<0.11	<0.87
Selenium	<0.0047	0.0026	<0.0045	<0.032
Thallium	<0.015	<0.14	<0.014	<0.11
Vanadium	<0.025	<0.023	<0.024	<0.18
Zinc	0.11	0.095	0.96	0.64
PM_{10}	NA	10.0	11.5	-

* Blank values are in ug/filter.
Source: Ecology and Environment, Inc., 1994.

Table 14
Chemical Summary Report For Air Sampling Results For
PCB/Pesticides
Area of Contamination: 32
(ng/m3)

Parameters	AX3201B1 (9/23/92)	AX3202B1 (9/23/92)	AX3203B1 (9/23/92)	AD3203B1* (9/23/92)	AB3200B1* (9/23/92)	METHOD BLANK*
alpha-BHC	<O.30	<0.30	0.59	0.37	<0.12	<0.12
PCB-1248	<6.2	<6.2	8.9	10.4	<2.5	<2.5

* Analytical results for blank samples are in ug/PUF

Source: Ecology and Environment, Inc., 1994

Table 15
Summary of Estimated Excess Cancer Risks
Associated with AOC 32

Pathway	Case	Receptor		Risk Contributions by Exposure Route[2]	Risk Contributions by Chemical[2]
		Adult	Adolescent		
Exposure Scenarios Potentially Complete Under Current Site Conditions					
Current Worker, Soil	RME	9.2×10^{-5}	-	Soil ingestion-26% Dermal contact-72% Vapor inhalation-2%	PCBs-74% Arsenic-20% Chrysene-4%
	Average	1.8×10^{-5}	-		
Current Trespasser,Soil	RME	7.9×10^{-6}	1.9×10^{-6}	Soil ingestion-28% Dermal contact-72% Vapor inhalation-<1%	PCBs-71% Arsenic-22% Chrysene-4%
	Average	1.6×10^{-6}	3.7×10^{-7}		
Exposure Scenarios Pontentially Complete Under Possible Future Site Conditions					
Soil and Air:					
Future Construction Worker,Soil	RME	1.7×10^{-5}	-	Soil ingestion-65% Dermal contact-15% Vapor inhalation-3% Particle inhalation-17%	Arsenic-61% PCBs-24% Chrysene-5% Nickel-3% Chromium(VI)-3% Cadmium-2% Beryllium-1%
	Average	2.1×10^{-6}	-		
Future Site Worker, Outdoor Soil	RME	1.3×10^{-4}	-	Soil ingestion-38% Dermal contact-60% Vapor inhalation-2%	PCBs-54% Arsenic-40% Beryllium-1%
	Average	1.3×10^{-5}	-		
Future Site Worker, Indoor Air Exposure	RME	8.8×10^{-7}	-	Vapor inhalation-100%	1,4-Dichlorobenzene-46% Trichloroethene-32% 1,2-Dichloroethane-19%
	Average	1.7×10^{-7}	-		
Groundwater:					
Future Site Worker, Unfiltered Groundwater, DRMO Yards	RME	6.0×10^{-3}	-	Drinking water ingestion-100%	Arsenic-61% Beryllium-3%
	Average	1.2×10^{-3}	-		
Future Site Worker, Filtered Groundwater, DRMO Yards	RME	5.7×10^{-5}	-	Drinking water ingestion-100%	Beryllium[b]-66% Arsenic-33%
	Average	4.7×10^{-5}	-		
Future Site Worker Filtered Groundwater, DRMO Yards	RME	2.0×10^{-5}	-	Drinking water ingestion-100%	Arsenic-94% TCE-4%
	Average	9.8×10^{-6}	-		
Future Site Worker, Unfiltered Groundwater, UST Area	RME	5.2×10^{-3}	-	Drinking water ingestion-100%	Arsenic-95% PCB-4% 1,4-Dichlorobenzene-1%
	Average	5.1×10^{-4}	-		

Table 15
Summary of Estimated Excess Cancer Risks
Associated with AOC 32

Pathway	Case	Receptor		Risk Contributions by Exposure Route[2]	Risk Contributions by Chemical[2]
		Adult	Adolescent		
Future Site Worker, Filtered Groundwater, UST Area	RME	6.2×10^{-4}	-	Drinking water ingestion-100%	Arsenic-57% PCB-33% 1,4-Dichlorobenzene-1% Trichloroethene-1%
	Average	1.2×10^{-4}	-		

a RME case for the receptor showing the greatest risk.
b Was not detected in the filtered groundwater. Risks are associated with a concentration equal to one half the quantitation limit.

Source: Ecology and Environment, Inc. 1994.

Table 16
Summary of Estimated Hazard Indices for Noncarcinogenic Effects Associated with AOC 32

Pathway	Case	Receptor		Risk Contributions by Exposure Route[2]	Hazard Index by Chemical[2]
		Adult	Adolescent[b]		
Exposure Scenarios Potentially Complete Under Current Site Conditions					
Current Worker, Soil	RME	5.8	-	Soil ingestion-20% Dermal contact-77% Vapor inhalation-2%	PCB_s-4.4 Lead[c]-0.9
	Average	0.80	-		
Current Trespasser, Soil	RME	0.41	0.49	Soil ingestion-25% Dermal contact-75% Vapor inhalation-<1%	-
	Average	0.057	0.067		
Exposure Scenarios Potentially Complete Under Possible Future Site Conditions					
Soil and Air:					
Future Construction Worker, Soil[h]	RME	28	-	Soil ingestion-54% Dermal contact-28% Vapor inhalation-6% Particle inhalation-12%	PCB_s[c]-13 Lead[c]-6 Arsenic-2 Mercury-1 Chromium(VI)[d]-2
	Average	2.4	-		
Future Site Worker, Outdoor Soil	RME	6.0	-	Soil ingestion-22% Dermal contact-76% Vapor inhalation	PCB_s[c]-4.4 Lead[c]-0.9
	Average	0.39	-		
Future Site Worker, Indoor Soil	RME	0.043	-	Vapor inhalation-100%	-
	Average	0.007	-		
Groundwater:					
Future Site Worker, Unfiltered Groundwater, DRMO Yards	RME	49	-	Drinking water ingestion-100%	Arsenic-30 Manganese-16 Lead[c]-3
	Average	12	-		
Future Site Worker, Filtered Groundwater DRMO Yard	RME	15	-	Drinking water ingestion-100%	Manganese-15
	Average	3.7	-		
Future Site Worker, Filtered Groundwater (Excluding Nondetected Metals), DRMO Yards	RME	15	-	Drinking water ingestion-100%	Manganese-15
	Average	3.7	-		
Future Site Worker, Unfiltered Groundwater UST Area	RME	48	-	Drinking water ingestion-100%	Arsenic-26 PCB[c]-15 Manganese-7
	Average	7.3	-		
Future Site Worker, Filtered Groundwater UST Area	RME	24	-	Drinking water ingestion-100%	PCB[c]-15 Manganese-7 Arsenic-2
	Average	5.1			

a RME case for receptor showing the greatest risk.
b Hazard indices for adolescent trespassers and future construction workers were calculated using subchronic RfDs.
c Hazard indices are based on RfDs taken from MADEP Residential Shortform (MADEP 1992), not EPA-approved.
d Chromium (VI) hazard is due to particle inhalation.

Source: Ecology and Environment, Inc. 1994.

Table 17
Summary of Estimated Excess Cancer Risks Associated with AOC 43A

Pathway	Case	Receptor		Risk Contributions by Exposure Route[2]	Risk Contributions by Chemical[2]
		Adult	Adolescent		
Exposure Scenarios Potentially Complete Under Current Site Conditions					
Current Worker, Soil	RME	2.1×10^{-5}	-	Ingestion-99% Dermal contact-21%	Arsenic-85% Carcinogenic PAHs-15%
	Average	2.8×10^{-6}	-		
Current Trespasser, Soil	RME	9.7×10^{-6}	2.3×10^{-6}	Ingestion-81% Dermal contact-19%	Arsenic-84% PAHs-15%
	Average	1.3×10^{-6}	3.2×10^{-7}		
Exposure Scenarios Potentially Complete Under Possible Future Site Conditions					
Soil:					
Future Construction Worker, Soil	RME	2.2×10^{-5}	-	Ingestion-36% Dermal contact-3% Inhalation-11%	Arsenic-83% Carcinogenic PAHs-17%
	Average	3.0×10^{-6}	-		
Future Worker, Soil	RME	1.0×10^{-4}	-	Ingestion-79% Dermal contact-21%	Arsenic-85% Carcinogenic PAHs-15%
	Average	1.4×10^{-5}	-		
Groundwater:					
Future Worker, Unfiltered Grounwater	RME	1.9×10^{-4}	-	Ingestion-100%	Beryllium->99%
	Average	4.1×10^{-5}	-		
Future Worker, Filtered Groundwater	RME	3.3×10^{-6}	-	Ingestion-100%	Beryllium-56% Trichloreothene-22% Cyclonite-14% 1,2-Dichloroethane-8%
	Average	2.4×10^{-6}	-		

a. RME case for the receptor showing the greatest risk.

Source: Ecology and Environment, Inc. 1994.

Table 18
Summary of Estimated Hazard Indices for Noncarcinogenic Effects Associated with AOC 43A

Pathway	Case	Receptor		Risk Contributions by Exposure Route[2]	Hazard Index by Chemical[2]
		Adult	Adolescent[b]		
Exposure Scenarios Potentially Complete Under Current Site Conditions					
Current Worker, Soil	RME	0.97	-	Ingestion-70% Dermal contact-26%	
	Average	0.017	-		
Current Trespasser, Soil	RME	0.038	0.046	Ingestion-78% Dermal contact-22%	
	Average	0.006	0.008		
Exposure Scenarios Potentially Complete Under Possible Future Site Conditions					
Soil:					
Future Construction Worker, Soil[b]	RME	4.7	-	Ingestion-93% Dermal contact-5% Inhalation-2%	Arsenic-4.1
	Average	0.75	-		
Future Site Worker, Soil	RME	0.50	-	Ingestion-73% Dermal contact-27%	
	Average	0.086	-		
Groundwater:					
Future Site Worker, Unfiltered Groundwater	RME	21	-	Ingestion-100%	Manganese-16 Lead[c]-3
	Average	3.9	-		
Future Site Worker, Filtered Groundwater	RME	2.7	-	Ingestion-100%	Manganese-1.2
	Average	0.81	-		

a RME case for receptor showing the greatest risk.
b Hazard indices for adolescent trespassers and future construction workers were calculated using subchronic RfDs.

Table 19
Chemicals of Potential Concern
AOC 32 - DRMO Yard

Chemical	Surface Water	Sediment	Asphalt	Subsurface Soil	Subsurface Soil	Groundwater
Metals						
Aluminum		E				X
Antimony	X	X		X	X	
Arsenic				X	X	X
Barium		X		X	X	X
Beryllium					X	X
Cadmium	X	X		X	X	
Calcium		X		X	X	X
Chromium		E		X	X	X
Cobalt		X		X	X	X
Copper	X	X		X	X	X
Iron		E		X	X	X
Lead	X	X		X	X	X
Magnesium		E		X	X	X
Manganese				X	X	X
Mercury		X		X	X	
Nickel		X		X	X	X
Potassium		E				X
Selenium				X	X	
Sodium						X
Vanadium		E		X		X
Zinc	X	X		X	X	X
Pesticides						
Aldrin				X		
y-Chlordane				X		
p,p'-DDD		X		X	X	X
p,p'-DDE			X	X	X	
p,p'-DDT		X	X	X	X	X
Dieldrin				X		
a-Endosulfan				X		
Heptachlor				X		
Heptachlor epoxide					X	
Lindane		X				
PCB's						
PCB-1016				X		
PCB-1248			X			
PCB-1254		X	X	X	X	
PCB-1260			X	X	X	X
Semivolatile Organics						
1,2,4-Trichlorobenzene						X
1,2-Dichlorobenzene						X
1,3-Dichlorobenzene						X
1,4-Dichlorobenzene						X
2-Methylnahthalene				X		X
Chrysene				X		
Dibenzofuran				X		
Flouranthene				X		
Flourene				X		

Table 19
Chemicals of Potential Concern
AOC 32 - DRMO Yard

Chemical	Surface Water	Sediment	Asphalt	Subsurface Soil	Subsurface Soil	Groundwater
Napthalene				X		
Phenanthrene				X		
Pyrene				X		
Volatile Organics						
1,1,1-Trichloroethane						X
1,2-Dichloroethane						X
1,2-Dichloroethene						X
Acetone					X	X
Benzene						X
Chloroform					X	X
Ethylbenzene						X
Toluene						X
Trichloroethene						X
Trichloroflouromethane					X	
Xylene						X
Other Organics						
Caprolactam						X
Lauric acid						X
Tetracosane						X
Total petroleum hydrocarbons		X		X	X	X
EPH/VPH				X	X	X

Note: Groundwater COPC selection is based on unfiltered groundwater data.

Key:

E = Elevated above sediment background levels but not soil background levels.
X = Selected as a COPC for the human health risk assessment.

Source: Ecology and Environment, Inc., 1994

Table 20
Chemicals of Potential Concern
AOC 43A - POL Storage Area

Chemical	Surface Soil	Subsurface Soil	Groundwater
Metals			
Aluminum			X
Antimony			X
Arsenic	X	X	
Barium			X
Beryllium			X
Calcium	X	X	X
Chromium			X
Cobalt	X	X	X
Copper	X		X
Iron			X
Lead	X	X	X
Magnesium			X
Manganese			X
Nickel	X	X	X
Potassium			X
Selenium			X
Sodium			X
Vanadium			X
Zinc	X	X	X
Explosives			
1,3,5-Trinitrobenzene			X
2-Amino-4,6-dinitrotolune			X
4-Amino-2,6-dinitrotoluene			X
1,3-Dinitrobenzene			X
2-Nitrotoluene			X
3-Nitrotoluene			X
4-Nitrotoluene			X
Cyclonite (RDX)			X
Pesticides/PCBs			
p,p'-DDD	X		
p,p'-DDE	X		
p,p'-DDT	X	X	
delta-Benzene hexachloride			X
Semivolatile Organics			
1,6-Dimethylindan		X	
2,4-Dimethylpentane		X	
Napthalene			X
1-Methylnapthalene			X
2-Methylnapthalane		X	X
4,6-Dimethylindan		X	
Pentadecane		X	
Hexadecane		X	
Benzo(a)anthracene			
Benzo(a)pyrne	X		
Heptadecane	X		
Acenapthalane	X		
Benzo(b)flourathene			X

Table 20 Chemicals of Potential Concern AOC 43A - POL Storage Area			
Chemical	Surface Soil	Subsurface Soil	Groundwater
BBDMMP[a]	X		
Benzo(k)flouranthene	X		
Benzo(ghi)perylene	X		
Chrysene	X		
Indeno(1,2,3-cd)pyrene	X		
Flouranthene	X		
Phenathrene		X	X
Pyrene	X		
Volatile Organics			
Acetone			X
Clrorophorm			X
Trichloroethene			X
Carbon disulfide		X	
1,2-Dichloroethane			X
Xylene		X	X
2,3,4-Trimethylpentane		X	
2,4-Dimethylpentane		X	
Decane		X	
Tetrachloroethane		X	
Other Organics			
Caprolactam			X
Total petroleum hydrocarbons	X	X	X
EPH.VPH	X	X	X

Note: Groundwater COPC selection is based on unfiltered groundwater data.
a. 4,4' Butylindenebis[2-(1,1-dimethylethyl)-5-phenol]

Source: Ecology and Environment, Inc., 1994

Table 21
Main Post Soil Cleanup Goal Determination

Analytes	ARARs		TBCs			Fort Devens Background Level (Maximum)	Human Health Risk Assessment Levels Concentrations Corresponding to 10^{-5} risk or HI=1	Candidate Cleanup Goal	Maximum Observed Concentration		Cleanup Goal	
	TSCA		Reg. III RBC Commercial/ Industrial Levels	RCRA Action Levels (Residential)	EPA Interim Cleanup level Superfund Sites				Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil
	Surface Soil µg/g (a)	Subsurface Soil µg/g (a)	µg/g (b)	µg/g (c)	µg/g (d)	µg/g (e)	µg/g (f, g)	µg/g (h)	µg/g (i)	µg/g (j)	µg/g	µg/g
Arsenic			3.3	80		19	24 (f)	24	210	37	24	24
Lead					400	48	426 (g)	426	2260	980	426	426
DDD			24	3				3	0.018	6.6		3
DDE			17	2		0.26		2	0.4	2.7		2
DDT			17	2		0.12		2	2.9	5.6	2	2

Key:
(a) Toxic Substance Control Act (TSCA) (15USC 2601) - The surface cleanup criteria is 1,000 µg/kg and the subsurface soil cleanup criterion is 10,000 µg/kg.
(b) EPA Region III Risk-Based Concentration Table (USEPA 1995 January - June) values for commercial/industrial soil.
(c) Calculated RCRA CMS Action Level as outlined in 55FR30798: 27 July 1990, corresponding to a hazard index of 0.2 in compliance with MDEP for residential soil.
(d) EPA Interim Guidance on Soil Lead Cleanup Levels at Superfund Sites, EPA 1991, OSWER Directive 9355.4-02a, 29 August 1991.
(e) Background levels for soil derived from data compiled by E&E; (see Appendix K of the RI Report for Functional Area II (E&E 1994a) for background data rationale).
(f) Concentration corresponds to a cancer risk of 10^{-5}.
(g) Concentration corresponds to a hazard index of 1.
(h) Candidate cleanup was chosen as follows: Values calculated from site-specific risk assessment, or ARARs, if available. If neither of these two values were available, the lowest value of the remaining TBCs was selected. If background concentration was higher than the selected value, the background concentration was used as the candidate cleanup goal.
(i) Maximum observed concentration based on RI surface soil data collected from DRMO and POL Storage Area.
(j) Maximum observed concentration based on RI soil boring data collected from DRMO and POL Storage Area.
(k) Proposed standard.

Table 22
Main Post Groundwater Cleanup Goal Determination

Analytes	ARARs				TBCs					Human Health Risk Assessment Levels Concentrations Corresponding to 10^{-5} risk or HI=1	Candidate Cleanup Goal	Maximum Observed Concentration	Cleanup Goal
	SDWA MCL	MMCL	SDWA MCLG	MA SMCL	SDWA SMCL	EPA Drinking Water HAs	EPA Region III Tap Water Risk-Based Concentrations	MA ORSG	Fort Devens Background				
µg/L (a)	µg/L (b)	µg/L (c)	µg/L (d)	µg/L (e)	µg/L (f)	µg/L (g)	µg/L (h)	µg/L (i)	µg/L (j)	µg/L (k)	µg/L (l)	µg/L (m)	µg/L (n)
Aluminum	50 (2)			50/200	50/200		37000		390		390	446	390
Arsenic	50 (3)	50				0.02	0.038		3.4	1.6 (j)	50	56	50
Iron	300 (2)			300	300				320		320	2800	320
Manganese	50 (2)			50	50		180		3500	500 (k)	3500	7700	3500
Sodium		28000 (4)				20000		28000	10000		28000	420000	28000
Thallium	2		0.5		0.4	0.4		2			0.5	1	0.5
Benzene	5	5	0			1	0.36				5	4	5
Total 1,2 Dichloroethene							55				55	60	55
Trichloroethylene (TCE)	5	5	0				1.6			26 (k)	5	200	5
alpha-Benzenehexachloride							0.011				0.011	20	0.011
DDT	0.5						0.28				0.5	7.5	0.5
PCB1260	0.5	0.5	0				0.0087			0.39 (j)	0.5	7.6	0.5
1, 3-Dinitrobenzene						1	3.7				1	12.0	1
1, 3, 5-Trichlorobenzene						1.8					1.8	3.04	1.8
Bis(2-ethylhexyl)phthalate	6	6 (4)	0				4.8	6			6	40	6

Table 22
Main Post Groundwater Cleanup Goal Determination

Analytes	ARARs				TBCs					Human Health Risk Assessment Levels Concentrations Corresponding to 10^{-5} risk or HI=1	Candidate Cleanup Goal	Maximum Observed Concentration	Cleanup Goal
	SDWA MCL	MMCL	SDWA MCLG	MA SMCL	SDWA SMCL	EPA Drinking Water HAs	EPA Region III Tap Water Risk-Based Concentrations	MA ORSG	Fort Devens Background				
1, 2-Dichlorobenzene	600		600			600	270				600	600	600
1, 3-Dichlorobenzene						600	540				600	1000	600
1, 4-Dichlorobenzene	75		75			75	0.44			12 (k)	75	600	75

Key:
(a) EPA Drinking Water Regulations (USEPA 1991c), MCLs. 40 CFR 143.
(b) Massachusetts Drinking Water Standards and Guidelines (Massachusetts 1992) 310 CMR 22.
(c) Maximum Contaminant Level Goal. Note: MCLGs of zero are not considered ARARs in accordance with the NCP.
(d) Secondary maximum Contaminant Goal, Code of Massachusetts Regulations, Title 310 Section 22, Effective 20 November 1992.
(e) National Secondary drinking Water Standards designed to protect the aesthetic quality of water (FR 42198, 19 July 1979; 51 FR 11396, 2 April 1986; 56 FR 3526, 30 January 1991)
(f) EPA Office of Water Lifetime Health Advisories (HA), May 1993.
(g) EPA Region III, Risk Based Concentration table (USEPA 1993 Fourth Quarter), values for tap water.
(h) ORSG: Office of research and Standard Guideline. Massachusetts Department of Environmental Protection, Spring 1993.
(i) Background levels based on maximum or average detected in upgradient wells or located background concentrations as follows: Arsenic and barium based on DRMO Yard local background. Calcium, Iron, Magnesium, Manganese, Potassium, Sodium, and Zinc based on POL upgradient well.
(j) Concentration based on cancer risk of 10^{-5}.
(k) Concentration based on a hazard index of 1.
(l) Remedial action objective was chosen as follows: lowest ARAs, if no ARARs, them human health risk assessment value. If risk is not calculated, then lowest-value of the TBCs. If TBC or ARAR was lower than background level, background was used.
(m) Maximum observed concentration based on RI and SI groundwater data collected from DRMO and POL. Maximum observed concentration for metals is based on filtered data only.
(n) Cleanup goal is below detection limit for this element. Cleanup should be to a level below detection limit.
(o) Action level.
(2) Secondary standard.
(3) Proposed standard.
(4) Massachusetts Guidance value.

Table 23
Natural Attenuation Assessment Sampling Parameters
AOCs 32 and 43A - Devens, Massacusetts

Parameter	Purpose
Dissolved Oxygen	Defines zone of potential aerobic activity (greater than 0.5 mg/l)
Redox	Define/confirm type of microbial respiration process occurring
Nitrate	Electron acceptor for anaerobic microbial respiration, microbial nutrient
Nitrite	Electron acceptor for anaerobic microbial respiration, microbial nutrient
Phosphate	Microbial nutrient (round 1 only)
Sulfate	Electron acceptor for araebic microbial respiration
Sulfide	Product of sulfate based microbial respiration
Manganese	Product or anaerobic biodegredation
Soluble iron FE II	Product of anaerobic biodegredation
Methane	Product of carbonate-based (CO2) microbial respiration (anaerobic degradation of carbon at redox less than -200mV)
Carbon dioxisde	Elevated concentrations can indicate an aerobic mechanism for bacterial degredation
EPH/VPH	Allows for comparison to risk based concentrations, provides BTEX, MTBE and PAH data
Arsenic	Comparison to PRGs
PCBs	Comparison to PRGs (UST #13 area only)
Trichloroethene	Comparison to PRGs
Dichlorobenzene	Comparison to PRGs
Lead	Comparison to PRGs
Ammonia-nitrogen	Baseline date (round 1 only)
TOC/COD	Baseline date (round 1 only)
Temperature	Well development/purge parameter
pH	Aquifer environment condition indicator
Conductivity	Well development/purge parameter; used as a marker to verify that site samples are from the same groundwater system
Alkalinity	Aquifer environment condition indicator

Table 24
Synopsis of Federal and State ARARs for Monitored Natural Attenuation
Area of Contamination 32 and 43A
Devens, Massachusetts

Location Specific

Authority	Location Specific	Requirement	Status	Requirement Synopsis	Action To Be Taken To Attain Requirement
Federal Regulatory Authority		No location-specific ARARs will be triggered.			
State Regulatory Authority		No location-specific ARARs will be triggered.			

Table 24
Synopsis of Federal and State ARARs for Monitored Natural Attenuation
Area of Contamination 32 and 43A
Devens, Massachusetts

Chemical Specific

Authority	Chmical Specific	Requirement	Status	Requirement Synopsis	Action To Be Taken To Attain Requirement
Federal Regulatory Authority	Groundwater (Also applicable as an Action Specific ARAR)	SDWA, National Primary Drinking Water Standards, MCLs [40 CFR Parts 141.11 - 141.16 and 141.50 - 141.52]	Relevant and Appropriate	The NPDWR establishes MCLs for several common organic and inorganic contaminants. MCLs specify the maximum permissible concentrations of contaminants in public drinking water supplies. MCLs are federally enforceable standards based in part on the availability and cost of treatment techniques.	Biodegradation of organic contaminants exceeding MCLs is believed to be occurring under existing conditions. MCLs will be used to evaluate the performance of this alternative through implementation of a long-term groundwater monitoring program will achieve MCLs at completion of remedy.
Federal Regulatory Authority	Groundwater	USEPA Reference Dose	TBC		
Federal Regulatory Authority	Groundwater	USEPA HAs	TBC		
State Regulatory Authority	Groundwater(Also applicable as an Action Specific ARAR)	Massachusetts Drinking Water Standards and Guidelines [310 CMR 22.0].	Relevant and Appropriate	The Massachusetts Drinking Water Standards and Guidelines list MMCLs which apply to water delivered to any user of a public water supply system as defined in 310 CMR 22.00. Private residential wells are not subject to the requirements of 310 CMR 22.00; however, the standards are often used to evaluate private residential contamination especially in CERCLA activities.	Biodegradation of organic contaminants exceeding MMCLs is believed to be occurring under existing conditions. MMCLs will be used to evaluate the performance of this alternative through implementation of a long-term groundwater monitoring program.

Table 24
Synopsis of Federal and State ARARs for Monitored Natural Attenuation
Area of Contamination 32 and 43A
Devens, Massachusetts

Action Specific

Authority	Action Specific	Requirement	Status	Requirement Synopsis	Action To Be Taken To Attain Requirement
Federal Regulatory Authority		RCRA Subtitle C Subpart F	Relevant and Appropriate	Groundwater protection standard.	
State Regulatory Authority	Groundwater	Massachusetts Groundwater Quality Standards [314 CMR 6.00]	Applicable	Massachusetts Groundwater Quality Standards designate and assign uses for which groundwater of the Commonwealth shall be maintained and protected and set forth water quality criteria necessary to maintain the designated uses. Groundwater at Fort Devens is classified as Class 1. Groundwater assigned to this class are fresh groundwater designated as a source of potable water supply.	Biodegradation of organic contaminants exceeding MMCLs is believed to be occurring under existing conditions. MMCLs will be used to evaluate the performance of this alternative through implementation of a long-term groundwater monitoring program.
State Regulatory Authority	Groundwater Monitoring	Massachusetts Hazardous Waste Management Rules (MHWMR) Groundwater Protection; [310 CMR 30.660-30.679]	Relevant and Appropriate	Groundwater monitoring is required during and following remedial actions.	A long-term groundwater monitoring program is to be implemented to monitor the progress of remediation.

Notes:

CERCLA = Comprehensive Environmental Response, Compensation and Liability Act
MCLs = Maximum Contaminant Levels
MHWMR = Massachusetts Hazardous Waste Management Rules
MMCLs = Massachusetts Maximum Contaminant Levels
NPDWR = National Primary Drinking Water Standards
SDWA = Safe Drinking Water Act

Table 25
Synopsis of Federal and State ARARs for Excavation and Off-site Disposal
Area of Contamination 32 and 43A
Devens, Massachusetts

Location Specific

Authority	Location Specific	Requirement	Status	Requirement Synopsis	Action To Be Taken To Attain Requirement
Federal Regulatory Authority		There are no location specific ARARs for the DRMO Yard.			
State Regulatory Authority		There are no location specific ARARs for the DRMO Yard.			

Table 25
Synopsis of Federal and State ARARs for Excavation and Off-site Disposal
Area of Contamination 32 and 43A
Devens, Massachusetts

Chemical Specific

Authority	Chemical Specific	Requirement	Status	Requirement Synopsis	Action To Be Taken To Attain Requirement
Federal Regulatory Authority	For surface soil (0 to 10 inches) For subsurface soil (below 10 inches)	Toxic Substance Control Act (TSCA) 40 CFR 761.125(c)(4)	TBC	Unrestricted access with less than 1 mg/kg PCBs. Unrestricted access with less than 10 mg/kg PCBs.	
Federal Regulatory Authority	Soil	EPA Region III Risk Based Concentration Table	TBC	Exposure levels to numerous chemicals under specific scenarios.	
Federal Regulatory Authority	Soil	Resource Conservation and Recovery Act (RCRA) Corrective Action Levels 55 FR 30798, July 1990.	TBC	To establish the need for a corrective measure study. Numerous chemicals.	
Federal Regulatory Authority	Soil	Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. EPA OSWER Directive 9355.4-12, July 1994	TBC		
State Regulatory Authority	Soil	Background levels for soil.	TBC		
State Regulatory Authority	Soil	Massachusetts Contingency Plan (MCP) 310 CMR 40.09705(6)(a)	TBC	Total petroleum hydrocarbons not to exceed 500 mg/kg.	